



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
<http://ageconsearch.umn.edu>
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

Vol XXV
No. 3

ISSN 0019-5014

CONFERENCE
NUMBER

JULY-
SEPTEMBER
1970

INDIAN JOURNAL OF AGRICULTURAL ECONOMICS



INDIAN SOCIETY OF
AGRICULTURAL ECONOMICS,
BOMBAY

Prospects for the Future

With the wage structure announced by the Commission, the wage rates for harvesting has risen by about 50 per cent in real terms (from 4 to 6 litres for every 54 litres) during the last 3 or 4 years. The rise would be higher by another one-third if we also take into consideration the rise in yield per acre consequent to the replacement of local varieties of paddy with HYV strains. The rise in wages for other agricultural operations would have been at least 25 per cent. With the gradual replacement of locally evolved HYV strains like ADT-27, and CO-25 by the exotict strains like IR-8, the per acre yield can be expected to go up still further, a substantial share of which would also go to the labourers. On these counts, one may expect the continuation of peaceful conditions in the agricultural labour front for the next few years to come. But one has to keep a watchful eye, since the introduction of the multiple cropping programme and the spread of highly labour intensive HYV crops like IR-8 over wide areas are likely to push up appreciably the demand for labour during the rush seasons synchronizing with the monsoons.

THE RECENT AGRICULTURAL REVOLUTION AND
THE AGRICULTURAL LABOUR

RAVINDER NATH SONI

Lecturer

*Department of Economics
Punjab University, Chandigarh*

The recent agricultural revolution in India has, no doubt, the potentials of bringing us much closer to our object of achieving self-sufficiency with regard to foodgrains. However, it may not be an unmixed blessing unless some other problems that are likely to arise in its wake, are effectively tackled. One such problem, having important welfare implications, is concerned with the impact of the revolution on the absolute as well as the relative economic position of the rural labour, especially the agricultural labour. This paper attempts to study this problem as it has emerged in the State of Punjab.

According to official pronouncements, there are only four crops, namely, rice, wheat, bajra and maize in the case of which high-yielding varieties have been introduced. This programme was started in 1966-67 and its progress so far has been shown in Table I.

It is clear from Table I that in the case of wheat, the pace of adoption of high-yielding varieties has been the highest. In 1968-69, out of the total area devoted to wheat (which is itself larger than the area devoted to any other crop), 58 per cent was under the high-yielding varieties. In the case of other crops such a ratio, as is clear from Table I, was quite low. In other words, we are perfectly justified in saying that the recent agricultural revolution in the Punjab is synonymous with the wheat revolution and any impact of the introduction of the

TABLE I—PROGRESS OF CULTIVATION OF CROPS OF HIGH-YIELDING VARIETY DURING THE PERIOD 1966-67 TO 1968-69

(in hundred hectares)

Year	Crop		Area under high-yielding varieties of seed	Area under other varieties of seed	Total	Percentage of area under high-yielding varieties to the total area under the crop
1966-67	Rice	..	44.51	2,805.49	2,850	1.76
	Wheat	..	571.41	15,508.59	16,080	3.55
	Bajra	..	5.67	1,834.33	1,840	0.30
	Maize	..	182.51	4,257.49	4,440	4.11
1967-68	Rice	..	169.31	2,970.69	3,140	5.39
	Wheat	..	6,247.83	11,652.17	17,900	34.90
	Bajra	..	511.39	1,578.61	2,090	24.46
	Maize	..	288.57	4,471.43	4,760	6.06
1968-69	Rice	..	265.05	3,184.95	3,450	7.68
	Wheat	..	11,938.51	8,691.49	20,630	57.86
	Bajra	..	815.02	1,114.98	1,930	42.22
	Maize	..	484.51	4,415.49	4,900	9.88

Source : Department of Agriculture, Punjab Government.

high-yielding varieties of wheat on the position of agricultural and other labour (as indicated by the cost structure of wheat produced) will be a clear indicator of the general trend. We have accordingly depended upon the cost of production of wheat data for discussing one important aspect of the problem, namely, the impact of the revolution on the *relative* position of agricultural labour.

TREND IN THE WAGE RATES OF AGRICULTURAL AND NON-AGRICULTURAL RURAL LABOUR

Before we take up the study of the impact of agricultural revolution on the relative economic position of the agricultural and other labour in the rural areas, it will be desirable to examine the trend in their wages after the beginning of the agricultural revolution in the State. Table II describes the wage situation in the State of Punjab during the last few years.

Table II shows both the money as well as real wages (in brackets) for different processes involved in agriculture. The real wages have been found by deflating the money wages by the Consumer Price Index Number for Agricultural Labourers in the Punjab (base 1960-61).

TABLE II—WAGES PAID TO THE AGRICULTURAL AND THE SKILLED LABOURERS
IN THE RURAL AREAS IN THE PUNJAB

(in Rs.)

Year ending June 30	Wages paid						
	Plough- ing	Sowing	Weeding	Harvest- ing	Picking of cotton	Black- smith	Carpen- ter
1965	3.46 (2.48)	3.40 (2.44)	3.31 (2.38)	4.01 (2.88)	2.69 (1.93)	5.46 (3.93)	5.46 (3.93)
1966	3.82 (2.58)	3.73 (2.52)	3.66 (2.47)	3.94 (2.66)	— —	6.12 (4.13)	6.08 (4.11)
1967	4.27 (2.20)	4.18 (2.15)	3.94 (2.03)	4.93 (2.54)	4.00 (2.06)	7.02 (3.62)	7.11 (3.66)
1968	4.70 (2.47)	4.74 (2.49)	4.59 (2.42)	6.14 (3.23)	4.00 (2.11)	8.29 (4.36)	8.61 (4.53)
1969	6.15 (3.18)	6.12 (3.17)	5.83 (3.02)	7.43 (3.85)	3.97 (2.05)	10.20 (5.28)	10.20 (5.28)

Source : Economic and Statistical Organisation, Punjab.

From the table, it is clear that the wages in the rural areas in the Punjab have been rising since the programme regarding the adoption of high-yielding varieties of crops was initiated in the State. A rise in wage rates as a result of the agricultural revolution was quite natural. High-yielding varieties of various crops require greater amount of labour per acre as compared with the indigenous ones. The rise in wages, however, has not been uniform for all processes involved in agriculture. This difference is not only because of the difference in the amount and nature of additional operations needed for the new programme but also due to the fact that in some of the processes, there is a high degree of substitution between labour and machinery. Ploughing, sowing and threshing are such operations. In such cases, we find that the rate of rise of money as well as real wages has been much lower than in the case of harvesting where such a rise has been the highest. (In fact, real wages in the case of ploughing and sowing have been practically static over the period except in the last year under study and the rise in the general wage rate is mainly because of rising wages at the time of harvesting.)

There is another significant fact which is revealed by Table II, and which is quite relevant for our purpose. It is that the rate of rise in the wages of the village artisans has been much higher than that of the wages of the agricultural labour. The reason for this difference in the relative rise in wages is not difficult to seek. The demand for skilled labour, especially the blacksmith and the carpenter depends in the first instance on the intensity of the agricultural operations, irrespective of the fact whether the operation is mechanized or not. This has enormously increased during the last few years on account of the agricultural revolution. There is another source of additional demand for the services of the skilled labour which can be directly traced to the agricultural revolution. It is the increase in the construction activities that have come up in the rural areas because of the increased

income of the farmers. The rise in the wages of the artisans might have been less if the supply of artisans were quite elastic. This, however, is not so. The supply of artisans can be increased only after an interval because of some training that is required to learn the art. The supply position regarding skilled labour could be eased if there were migration of such labour from the non-agricultural sector. That too has become less probable because of extensive construction activities in the non-agricultural sector itself. In fact, it is the relatively greater elasticity of supply of the agricultural labour which is to some extent responsible for the comparatively slow rise in its wages. Relatively greater supply of agricultural labour is mainly due to the tendency of the female folk in the rural areas to join the labour force in times of scarcity. Even the artisans have been found joining the agricultural labour force during the harvesting season if they were free. Such a flexible supply situation does not exist in the case of village artisans.

SHARE OF RURAL LABOUR IN THE NET OUTPUT PRODUCED BY THE AGRICULTURAL SECTOR

From the above discussion, we can conclude that after the advent of the recent agricultural revolution, average real wages of the rural labour in general have increased. We have still to see how this factor has fared vis-a-vis others. For this purpose, as indicated earlier, we have relied upon the analysis of the cost of production data concerning wheat which was the main harbinger of agricultural revolution in this State.¹

As high-yielding varieties of wheat are sown only on the irrigated land, we have studied the changes in the cost of production of irrigated wheat only. The costs have been studied for two consecutive years, namely, 1967-68 and 1968-69. It may be noted that for finding out the cost of production, no distinction has been made between the indigenous and the high-yielding varieties of wheat. It is the cost of a composite unit of wheat. However, as the ratio between the indigenous and the high-yielding varieties of wheat has considerably changed in favour of the latter during the period of study, there is sufficient justification for our associating the changes in the cost structure with the changes in the composition of wheat itself.² Again, as the comparison between the cost structures relates to two consecutive years, there is every plausibility of the assumption that other things have almost remained unchanged.

The estimates of the costs have been based upon the study of more than 250 holdings (for each year) evenly spread over the whole of the Punjab State. The holdings were selected through multi-stage random sampling method.

Table III shows the cost of production of wheat for the year 1967-68 and 1968-69.

1. The cost of production has been calculated on the basis of information obtained from the office of the Economic Advisor to the Punjab Government.

2. In the case of the farms under study, whereas in 1967-68, out of a total area of 2,115.02 acres devoted to wheat, 1,020 acres were under high-yielding varieties, in 1968-69, 2,113.93 acres out of a total area of 2,599.45 acres were under these varieties of wheat.

TABLE III—COST OF PRODUCTION OF WHEAT (IRRIGATED) FOR THE YEARS 1967-68 AND 1968-69

(in Rs.)

Cost element	1967-68	1968-69
Human labour	133.43	172.42
Bullock labour	72.36	112.28
Seed	25.46	36.49
Farmyard manure	1.35	4.48
Fertilizers	23.45	49.47
Implements and machinery	16.38	26.48
Interest on working capital	3.66	5.49
Land revenue	1.70	1.84
Rent	175.84	205.24
Irrigation	30.61	57.83
Artisan	4.39	6.84
Miscellaneous	1.55	2.22
Total	490.18	681.08

It is clear from Table III that at current prices, the total earnings of labour³ on account of wheat production have increased by 29 per cent. This percentage comes down to 27 when adjustments are made in it for the changing cost of living as indicated by the Cost of Living Index Number for Agricultural Labourers in the Punjab.

For knowing how the relative share of labour has fared during these two years, we, in the first instance, found out the average value of gross output of wheat per acre for these two years. This came out to be Rs. 573.17 and Rs. 816.76 for the years 1967-68 and 1968-69, respectively. Out of this, we deducted the value of all intermediate inputs, namely, the expenses incurred on the maintenance of bullock labour, seed, farmyard manure, fertilizers, irrigation and miscellaneous items. Imputed value of depreciation (shown as implements and machinery in the above table) was also deducted from the value of gross output. The balance gave us what we can call 'Social Income' (a concept corresponding to 'value added by manufacture' in national income compilations)—a value representing the sum of earnings of all the factors together. This value was of the order of Rs. 402.01 and Rs. 527.51 for the year 1967-68 and 1968-69, respectively. Labour's share in this 'social income' generated by the cultivation of an acre of irrigated wheat was 33.4 per cent and 32.8 per cent, respectively, indicating a slight decline in its relative share over the period.

3. Human labour includes both the hired and the family labour. Family labour has been evaluated at the rate at which the permanently hired labour was available in the area.

This decline in the relative share of labour needs a further probe if it has to point to certain guidelines for policy making. We have, accordingly, tried to know how the share of labour has behaved on farms of different sizes. For the purpose, we divided all the farms into two groups, namely, farms below 17.5 acres and those above 17.5 acres in size. We called them small and large farms, respectively.⁴ Social income per acre of wheat on these farms and the absolute as well as relative share of labour in it was computed. Table IV accordingly emerged.

TABLE IV

(in Rs.)

Year	Small farms			Large farms		
	Social income per acre	Share of labour	Col. (2) as percentage of col. (1)	Social income per acre	Share of labour	Col. (5) as percentage of col. (4)
	(1)	(2)	(3)	(4)	(5)	(6)
1967-68	451.31	156.72	34.7	386.66	127.50	33.0
1968-69	549.08	196.77	35.8	521.27	166.32	31.9

Table IV shows that on the small farms, the relative share of labour has in fact gone up after the agricultural revolution. It is the large farm which does not ensure as equitable distribution of new gains as the small farm. In absolute terms, the wage bill has gone up on both types of farms. Whereas it increased by 25.5 per cent on small farms, it went up by 30.4 per cent on large farms. Social income, on the other hand, has increased by 21.7 per cent on small farms and by 34.8 per cent on large farms. This shows that the non-labour factors have been able to benefit more from the agricultural revolution as compared with labour if they were associated with large farms.

A further examination of the data reveals that it is not because of any adverse movement of wages on large farms that the relative share of labour has gone down on such farms. The average wage has risen on both types of farms in almost the same proportion, *i.e.*, by 7 per cent. Whereas on small farms, it has increased from Rs. 5.73 per man-day to Rs. 6.15 per man-day, it moved from Rs. 5.66 to Rs. 6.03 on large farms. So far as increase in employment is concerned, it is in fact higher on large farms than on small ones. Whereas per acre employment of labour (in terms of man-days) increased from 27.4 to 32.0 in the case of small farms, it increased from 22.5 to 27.5 on large farms. What then is the reason for the decline in the relative share of labour on large farms? Obviously, the economies of scale have been in operation so far as the use of new input is concerned. Due to these economies, the large farmer has not only been able to increase the share of labour but also to provide for a still greater return for the services rendered by factors other than labour. Whatever be the situation earlier, the output-input ratio has moved in favour of large farms after the recent agricultural revolution.

Incidentally, the data have also shown that the share of artisans in the net output produced by an acre of wheat has increased both in absolute as well as in relative terms. This has happened on both types of farms.

4. The dividing line between large and small farms is quite arbitrary. A farm of 17.5 acres in size stands almost midway between the smallest farm and the largest farm that have been covered by the present study.

CONCLUSIONS

The recent agricultural revolution has brought about an increase in both money as well as real wages of the agricultural and non-agricultural rural labour. Wages of non-agricultural labour have increased at a higher rate as compared with those of the agricultural labour. The share of the agricultural labour in the 'social income' has increased in absolute terms. In relative terms, its share has gone down as compared with that of other factors of production. Large farms have played an important role in bringing about this change. They seem to have, in a way, a paradoxical significance in the context of recent agricultural revolution. It is on large farms (as compared with small farms) that the absolute increase in the share of labour is greater; it is again the large farms that have provided a relatively greater amount of additional demand for labour and it is also on these very farms that the relative share of labour vis-a-vis others in the 'social income' has gone down. This has been so mainly because of the economies of scale which the large farmers have been able to enjoy during their shift to the high-yielding varieties of various crops. These economies not only enabled them to meet a larger wage bill but also to have a still greater reward for the services of all others associated with their farms.

THE IMPACT OF NEW AGRICULTURAL TECHNOLOGY ON RURAL
EMPLOYMENT IN NORTH-WEST U.P.

S. L. SHAH AND L. R. SINGH

Department of Agricultural Economics
U. P. Agricultural University
Pantnagar (Dist. Nainital)

The small farmers and the landless labourers constituting about 90 per cent of the rural community depend on agricultural employment for their subsistence. Opinions have been expressed that the high-yielding varieties programme has increased the demand for labour but the wage rates have not risen as the supply of labour is quite elastic. It is also seen that the medium and large farmers have intensified their agriculture by double and multiple cropping. This has led to mechanization of farm operations and a decrease in the employment of farm labour. A feature of the new technology is that skilled labour is needed to perform the technically exacting routine of machinery, water, soil and crop management, etc.

A permanent labour force is, therefore, maintained. As a matter of fact, we have very few systematic, scientific and empirically based studies concerning the effect of new agricultural technologies on employment.

The purpose of this paper is to show that employment of both permanent and casual labour in progressive medium and large farms has gone up and that employment goes down as the farms become mechanized. It is also brought out that technology and farm income have significant impact on the demand for labour.