

## Changes in the Labour Share in the Total Output of Farms in Hissar District

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The study revealed that such non-mechanical inputs as fertilizers, manures, seeds, pesticides etc. required more labour whereas mechanical inputs like farm machinery, pump sets etc., required less labour in farm production. Since the Green Revolution brought in more use of both non-mechanical and mechanical inputs, the net effect was found to be reduction of labour in share in the total output, which was the order of 10.01 per cent. If the Green Revolution spreads to other parts of India, the reduction of labour share in the total output might be considerable. Hence the surplus labour may have to be diverted to small scale industries in rural areas. This has to be given due thought by policy makers.

The rapid adoption of high-yielding varieties in Punjab and Haryana and somewhat premature mechanization of farms has raised several issues problems which need to be appraised by research workers. Of these issues, the displacement of farm labour owing to adoption of modern technology is of practical importance in a country where man-land ratio is very high. The present study was taken up to study the impact of Green Revolution on labour share in the total farm output over time. The time periods selected were the agricultural years 1966-67 and 1969-70 i. e., the periods before and after Green Revolution.

### MATERIAL AND METHODS

In order to assess the change in labour share in the total farm output, production model was used at two

points of time, as of 1966-67 and 1969-70, i. e., before and after Green Revolution for Hissar district with farm income as the function of land, hired labour non-mechanical and mechanical inputs:

The model used is

$$Y = A L^{\alpha} H^{\beta} I_1^{\gamma} I_2^{\delta} \quad \text{for 1966-67} \quad (1)$$

$$\text{and } Y = A' L^{\alpha'} H^{\beta'} I_1^{\gamma'} I_2^{\delta'} \quad \text{for 1969-70} \quad (2)$$

Where Y = total farm income in rupees, L = Total land value in rupees; H = total hired labour converted in rupees; I<sub>1</sub> = total value of non-mechanical inputs comprising fertilizers, manures, farm yard manures, seeds, pesticides and home produced seeds in rupees; I<sub>2</sub> = total value of mechanical inputs

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comprising fuel, oil and electric charges and hiring farm machinery in rupees.  $\alpha$ ,  $\beta$ ,  $\gamma$  and  $\delta$  are the parameters to be estimated. As an effect of Green Revolution, we assume that  $\Delta I_1 > 0$ ,  $\Delta I_2 > 0$ ; If  $I_1$  is labour using type, we have

$$\frac{\beta}{\gamma} < \frac{\beta^1}{\gamma^1} \quad \text{--- (3)}$$

If  $I_2$  is labour saving type, we have

$$\frac{\beta^1}{\delta^1} > \frac{\beta}{\delta} \quad \text{--- (4)}$$

If net effect of Green Revolution between 1966-67 to 1969-70 is to

$$\frac{\text{Regression sum of squares due to labour}}{\text{Total sum of squares}} \times 100 \quad \text{--- (6)}$$

Hissar district was purposively selected for this study. The district was divided into three zones and from each zone four villages were selected at random such that two of them belonged to urban area and the remaining two to the rural background. Further, from each of the selected villages, 9 farm holdings were selected at random in such a way that they consisted of

reduce labour share in the total output, these net changes can be verified from the inequality.

$$\left( \frac{\beta}{\gamma} + \frac{\beta}{\delta} \right) > \left( \frac{\beta^1}{\gamma^1} + \frac{\beta^1}{\delta^1} \right) \quad \text{--- (5)}$$

Usually the elasticity coefficient of labour  $\beta$ , is taken as the labour share in the total output. However, when the elasticity coefficient is negative, as happened in the present study, the labour share in the total output can be estimated with the following formula.

3 small, 3 medium and 3 large holdings. Thus, there were in all 108 farm holdings for our investigation for each of the years 1966-67 and 1969-70.

## RESULTS AND DISCUSSION

The averages of different variables included in the functional analysis are given in Table I.

TABLE I Averages of variables included in the model.

Year	Total farm income	Land	Hired Labour	Non-mechanical inputs	Mechanical inputs
1966-67	8406.15	44391.83	451.13	454.46	3.71
1969-70	12,003.33	45467.36	389.01	807.98	14.02

It will be seen from Table I that the average value of hired labour employed decreased from 1966-67 to 1969-70 i. e., before and after Green Revolution. The average value of value of non-mechanical inputs has almost doubled and mechanical inputs increased four times within the above

period. The average value of total output increased one and half times within the said period though the land value did not increase considerably during the same period.

The estimates of the elasticity coefficients with their standard errors are given in Table II.

TABLE II Production elasticities, standard errors and coefficients of determination.

Year	Land	Hired Labour	Non-mechanical inputs	Mechanical inputs	R <sup>2</sup>
1966-67	0.73655 ** (0.0606)	-0.12964 (0.0246)	0.54771 ** (0.0660)	-0.02673 (0.0160)	0.85065 **
1969-70	0.27214 (0.0880)	0.02112 (0.0340)	0.44003 ** (0.1033)	0.01543 (0.0202)	0.62553 **

\*\* Significant at 1 per cent level.

Figures in parenthesis are standard errors.

The estimated R<sup>2</sup> values for both the years 1966-67 and 1969-70 were found significant at 1 per cent level thereby indicating that the variables included in the model explained the total variation to the extent 85 and 63 per cent respectively. All the estimates of elasticity coefficients were found significant at 1 per cent level except in the case of mechanical inputs for both the years and hired labour and land in 1969-70. It can be verified that the inequalities (3), (4) and (5) satisfy in this case. Therefore from this study it could be seen that  $I_1$  and  $I_2$  was considered as labour using and labour saving types respectively. Further it was observed that the net effect of Green Revolution

was to reduce labour share in the total output.

Since the estimated elasticity coefficient for hired labour was negative in 1966-67, the labour share in the total output may be estimated from the expression given in (6) for each of the years 1966-67 and 1969-70, which were obtained as 13.49 and 3.48 per cent respectively. Hence the net affect of Green Revolution on the reduction of labour share in the total output was given as  $(13.49 - 3.48) = 10.01$  per cent.

#### REFERENCE

- SRIVASTAVA, U. K., R. W. CROWN and E. O. HEADY. 1971. "Green Revolution, and farm income distribution" *Economic and Political Weekly*, December, 25.