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The hypothesis that a lower bargaining power as reflected by land concentration ratio<sup>10</sup> exerts a dampening effect on wages or growth of real wages is supported by column 8. The low concentration ratio was associated with high increase in real wages and the highest rate of growth of real wages. Higher concentration ratios were found associated with lower growth rates of wages.

Our findings clearly establish the hypothesis that low wage areas have experienced the highest rates of growth of wages and that barring a few exceptions they have also experienced higher rates of growth of capital accumulation relative to labour. The anomalous phenomenon of the growth process with respect to lagging regions has already been pointed out. A possible explanation might be that in those areas the marginal efficiency of investment is influenced by the price of crops produced in the region and by their production functions.

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## FACTORS DETERMINING AGRICULTURAL WAGES —A CASE STUDY

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A study of regional variation in agricultural wage rates and the factors accountable for it is of particular interest for policy formulation. Agricultural wages are high in some regions and low in others. These differences are associated with a number of factors. The present study is concerned with the analysis of the variation in agricultural wage rates between 16 villages in four districts of Bihar in terms of variation in certain factors affecting wages.

## II

The factors influencing wages may be both on the demand side and supply side. The factors which can raise the demand for labour must push up the

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10. A caution is warranted in the interpretation of concentration ratio. A high value of C may result from a high value of numerator for a given value of denominator or a low value of denominator for a given value of numerator. Different interpretation is suggested for the latter case.

Space restricts presentation of wage rates for increasing values of numerator holding the denominator constant at different levels. For the same reason districtwise results could not be appended.

wage rate. Similarly, a factor which can raise the supply of labour must depress the wage rate. In an irrigated region, labour use per acre is greater than that in the unirrigated region.<sup>1</sup> The availability of irrigation in an area is, thus, expected to increase the demand for labour and the wage rate. The availability of irrigation in a region leads to a number of favourable sequences inducing higher demand for labour and wage rate. In the irrigated region, the intensity of cropping is higher.<sup>2</sup> A higher percentage of cultivated area is brought under the High Yielding Varieties (HYV) Programmes and crops intensive in the use of labour are grown.<sup>3</sup> These are likely to increase the demand for labour<sup>4</sup> and wage rate. The wage rate is likely to be determined also by the size of holding. The larger is the size of holding the higher will be the demand for labour and a higher wage rate.

On the supply side, wages will be influenced by the proportion of agricultural labour households to the total rural households. A higher proportion of agricultural labour households to the total rural households means a large supply of agricultural labour and a low wage rate. On the other hand, a low proportion of agricultural labour households would improve the bargaining position of the labourers and will ensure a higher wage.

Agricultural wages are likely to be affected by the job availability and wage rates outside agriculture. If only the wage rate in the non-agricultural sector is higher, but the alternative employment opportunities for agricultural labour in this sector is limited, it will have very little effect on the agricultural wage rate. The availability of alternative wage employment for agricultural labour in the non-agricultural sector in India is extremely limited. The Second Agricultural Labour Enquiry<sup>5</sup> reports that out of 222 days of employment, on an average, for agricultural labourers, non-agricultural employment was available to them for 27 days only.

The demand for agricultural labour and wage rate are likely to be influenced by farm mechanization. If agricultural operations are mechanized, the demand for labour may fall, depressing the wage rate. But the degree of mechanization in Indian agriculture is insignificant and nowhere the adverse effect of mechanization on labour employment and wage rate has been reported so far. In Punjab where mechanization of farming operations has been adopted on a large scale, labour employment and wage rate have not fallen.<sup>6</sup>

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1. C. f. Studies in the Economics of Farm Management, Combined Report, 1955-56 to 1956-57 Uttar Pradesh, Punjab, West Bengal, Madhya Pradesh (Combined Report 1955-56 to 1956-57), Orissa, 1969-70.

2. *ibid.*

3. *ibid.*

4. See R. K. Lahiri, "Impact of HYVP on Rural Labour Market," *Economic and Political Weekly*, Vol. V, No. 39, September 26, 1970.

5. Report of the Second Agricultural Labour Enquiry, Vol. 1 —All India, 1956-57, Labour Bureau, Ministry of Labour and Employment, Government of India, 1960.

6. S. S. Grewal and A. S. Kahlon, "Factors Influencing Labour Employment on Punjab Farms," *Agricultural Situation in India*, April, 1974.

In Bihar mechanization is too insignificant to produce effect on wage rate.<sup>7</sup>

### III

#### SOURCES OF DATA AND METHODOLOGY

The data for this study were collected in 1973-74 from the households of 16 villages of 4 districts in Bihar. Those districts were Palamau, Ranchi, Rohtas (old Shahabad) and Purnea, exclusive of Kishanganj subdivision.<sup>8</sup> The selection of these districts was made purposively.

Of these 4 districts, Palamau and Ranchi have low irrigational facilities, with almost absence of dependable sources of irrigation from canals and tubewells. The percentages of irrigated areas are low and the areas irrigated are fed mostly by tanks and wells which dry up when water is almost needed. Due to the low percentage of area under irrigation, the intensity of cropping is low. On the other hand, Rohtas and Purnea have a high proportion of area under irrigation. Both the districts are getting assured irrigation from canals. Besides, tubewell irrigation is also popular in these districts, because of soft soil and high level of underground water. The intensity of cropping in these districts is high.<sup>9</sup>

It is expected that the wages will be higher in Rohtas and Purnea districts than in Palamau and Ranchi. But a district is not a homogeneous region and there can be a considerable variation in the wage rate, and the factors determining wages between different villages, and blocks of a district. A realistic approach, therefore, appear to be the analysis in terms of inter-village variation than in terms of inter-district variation. The data on agricultural wage rate for certain selected villages in each districts are collected by the Directorate of Economics and Statistics, Ministry of Food and Agriculture, Government of India. But the number of villages reporting wages does not exceed 2—3 in each district. Moreover, the villages are selected not randomly but at the convenience of the reporting agencies. Villages selected are generally near to the town or fall on the motorable roads, where the wages are determined more by the wages and employment in the suburban towns. For this reason, the data were collected at the village levels.

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7. In Bihar, there was one tractor per 13,600 acres of net sown area in 1969. *Vide* Annual Season and Crop Report for the Agricultural Year, 1969-70, Directorate of Statistics and Evaluation, Government of Bihar.

8. Kishanganj subdivision was excluded, as that area was not served with the canal irrigation.

9. The percentage of gross irrigated areas to the net sown areas was 92 in Shahabad, 36 in Purnea (exclusive of Kishanganj), 28 in Palamau and 3 in Ranchi district. The proportion of irrigated area to area irrigated through canals and tubewells were 79 per cent, 96 per cent 11.4 per cent and 41 per cent in the four districts respectively. The corresponding intensity of cropping was 152 per cent, 133 per cent, 123 per cent and 109 per cent.

Source : Annual Season and Crop Report, *op. cit.*

In each districts 2 blocks and from each block 2 villages were selected randomly. In villages complete household surveys were done. The wage data were collected from the agricultural labour households<sup>10</sup> and the data on the intensity of cropping area under irrigation, HYV areas and size of holdings were collected from the cultivating households. The data are presented in Table I.

The wage rate refers to the average wage rate for 8 man-hours for male agricultural labourers and it is the simple average of the wage rates in farm operations, namely, ploughing, sowing, weeding, transplanting, harvesting and others. The wage rate for blacksmith, carpenters and cobblers and technicians are not included in these figures. The wage rates for female and child labourers were not considered separately on the assumption that there would be a similar variation in the wage rates for female and child labourers as in the case of the male agricultural labourers. The wages were given mostly in kind and the same were converted into cash equivalent at the village price in that year.

#### IV

##### THE MODEL AND THE RESULTS

The inter-village variation in agricultural wage rate is explained by using the regression equation of the following nature :

$$Y = a + b_1x_1 + \dots + b_n x_n$$

where,

Y =daily wage rate for male agricultural labour in rupees,

a =constant for the equation,

$b_1$  =coefficient of the independent variable, and

$x_1$  =the independent variable.

The independent variables considered in this study are :

$x_1$  =the percentage of net sown area irrigated, alternatively,

$x_2$  =the percentage intensity of cropping,<sup>11</sup>

$x_3$  =average size of operational holdings, and

$x_4$  = the percentage of agricultural labour households to the rural households.

The area under HYV as a percentage of cropped area was found highly correlated ( $r=+.95$ ) with the percentage of net sown area irrigated. We decided to retain the percentage of net sown area irrigated in our regression analysis and dismissed with the HYV area, as the latter would also depend on

10. A household was considered to be an agricultural labour household if 50 per cent or more of its earnings were derived by the members in the previous year from wage earnings in agricultural operations including crop production, dairy farming, horticulture, bee rearing, poultry, etc.

11. The intensity of cropping refers to the ratio of gross cropped area to the net sown area.

TABLE I—INTER-VILLAGE VARIATION IN DAILY WAGE RATES FOR MALE AGRICULTURAL LABOUR AND CERTAIN ASSOCIATED VARIABLES FOR 16 VILLAGES OF 4 DISTRICTS IN BIHAR

Districts	Blocks	Villages	Number of households	Agricultural labour households as percentage of total rural households	Intensity of cropping (per cent)	Percentage of net area irrigated	Average size of holding (acres)	Area under HYV as percentage of cropped area	Average daily wage rate (Rs.)
1	2	3	4	5	6	7	8	9	10
Purnea	{ Forbesganj	{ Bishunpur ..	70	38.6	153	60.3	5.77	37.2	3.71
		{ Mushari ..	269	51.3	131	24.8	7.21	13.9	2.95
	{ Kasha	{ Banaili ..	102	32.3	168	67.4	6.83	29.4	3.58
		{ Sarra ..	124	29.8	142	27.5	5.52	20.3	3.00
Ranchi	{ Karra	{ Nauringa ..	41	26.9	115	8.2	5.39	3.5	2.65
		{ Gumru ..	40	22.5	133	12.5	4.86	3.6	3.08
	{ Senha	{ Badla ..	107	34.6	137	18.1	7.29	10.3	2.75
		{ Hesag ..	55	27.2	93	4.3	3.89	1.2	2.00
Rohtas	{ Karakat	{ Basdiha ..	81	18.5	220	85.2	5.40	47.5	5.79
		{ Itma ..	125	30.4	186	64.4	6.66	44.6	5.29
	{ Nankatta	{ Bandu ..	88	26.1	184	93.0	5.57	50.1	4.50
		{ Matiawan ..	43	41.9	97	7.2	7.38	2.7	3.00
Palamau	{ Hussainabad	{ Pansa ..	229	27.8	126	12.1	5.85	8.2	3.71
		{ Dulhar ..	52	30.8	158	27.7	7.02	12.1	3.64
	{ Bishrampur	{ Pandu ..	276	35.5	156	17.3	6.36	9.8	4.15
		{ Ketat ..	321	41.4	137	14.6	3.78	7.4	4.21

the irrigational facilities. The correlation coefficient ( $r$ ) between the percentage of intensity of cropping and the percentage of net sown area irrigated was significant ( $+ .63$ ) but it was not so high as in the previous case. These variables were, however, considered alternatively.

When the regression coefficients of variables  $x_1$ ,  $x_3$  and  $x_4$  are estimated, the result is

$$Y = 61.7686 + .0269^{***}x_1 + 1.3821^{**}x_3 - .0020x_4$$

$$(.0042) \quad (.5293) \quad (.0011)$$

$$R^2 = .727, \text{ d.f.} = 12.$$

(The figures in parenthesis refer to the standard errors of the coefficients. \*\*\*, \*\*, \* refer to the coefficients significant at 1 per cent, 5 per cent and 10 per cent levels respectively).

The wages are seen to respond positively to the variation in the irrigated areas and the size of holdings and negatively to the proportion of agricultural labour households, as was expected. The coefficients of all these variables are significant and these taken together explain about 73 per cent of the variation in the agricultural wage rate. If in the place of irrigation, the intensity of cropping ( $x_2$ ) is taken, the result is similar :

$$Y = 147.6388 + .0134^{**}x_2 + 3.1994^{**}x_3 - .0016x_4$$

$$(.0054) \quad (1.4732) \quad (.0012)$$

$$R^2 = .683, \text{ d.f.} = 12.$$

But these taken together explain a relatively smaller proportion of inter-village variation (68 per cent) in the wage rate. The coefficient of all the variables are significant. But of the two, the percentage of irrigated area and the intensity of cropping, the former is more significant than the latter. If we consider the percentage of net sown area irrigated as the only factor on the demand side and the proportion of agricultural labour households on the supply side the result is

$$Y = 2.7586 + .284^{***}x_1 - .0021x_4$$

$$(.0067) \quad (.0016)$$

$$R^2 = .664, \text{ d.f.} = 13.$$

The coefficients of net sown area irrigated is again significant at 1 per cent level. The coefficient of the proportion of agricultural labour households is significant at 10 per cent level as in the previous equations. These two factors explain 66 per cent of the variation in the wage rate. This shows that irrigation is the major factor responsible for the inter-village variation in the agricultural wage rate.

## V

## CONCLUSION

The study has shown that the agricultural wage rate responds positively to the percentage of area irrigated, the intensity of cropping and the average size of holdings and negatively to the proportion of agricultural labour households. These variables explained a very high percentage of variation in the agricultural wage rate among the villages. Of all the variables, irrigation appeared to be the major determinant of wages. This might happen, as irrigation leads to a number of favourable sequences such as greater intensity of cropping and greater percentage of area under the HYV programme, thus increasing the demand for labour and the wage rate. Thus, it follows that an increase in irrigation and intensity of cropping in an area will lead to higher agricultural wage rate, other things remaining the same.

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MINIMUM WAGES FOR AGRICULTURAL LABOURERS  
IN WEST BENGAL

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In order that a substantial portion of the population in a developing but labour surplus economy is not totally deprived of the benefits of development, a guarantee in the form of a flexible minimum wage varying directly with the cost of living is indispensable. It is proposed to examine the impact of the existing provisions of minimum wages upon the actual levels of agricultural wages in some regions of West Bengal, in particular, and in the State, in general, with the help of empirical data as well as other evidences.

## II

Endeavours on the part of the Government of West Bengal in fixing minimum wages statutorily are noticeable, specially, in the 'sixties of the present century, although efforts were made by the Government of India in this direction as early as 1948 when the Minimum Wages Act of India was enacted for different States of the Indian Union.