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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.

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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.

Methodology

In this paper data are taken from a study[1] in which a sample of 242 progressive[2] and 161 less progressive farmers in three size-groups of holdings, *viz.*, small with less than 10 acres, medium between 10-30 acres and large with holdings of above 30 acres were randomely selected from North-West Uttar Pradesh. Only medium and large farms are considered here as most of the demand for labour is made by them. By cross comparison of the progressive and less progressive medium and large farms it is shown that employment is higher on progressive farms. To show the effect of mechanization on employment farms are categorised as tractor farms and typical farms. Tractor farms are those which had tractors and power threshers and the rest are called typical arms. A comparison between the tractor and typical farms in expenditure per acre for casual and permanent labour is made. To find the impact of the new technology consisting of HYV seed, fertilizers and mechanization and also increasing farm income on the demand for labour a regression is run with demand for labour as the dependent and technology, farm income and bullock power as the independent variables on progressive medium and large farms with cross-sectional data for the agricultural year 1967-68.

Data Analysis

Table I shows that the progressive medium and large farmers have greater intensity of cropping and more employment of permanent labour as compared

TABLE I—OPERATED AREA, PROPORTION OF CROPPED AREA UNDER HYV AND IRRIGATION, INTENSITY OF CROPPING, AVERAGE NUMBER OF PERMANENT WORKERS AND PER ACRE EXPENDITURE ON CASUAL AND PERMANENT LABOUR

Farmer type	Number of cultivators	Operated area in acres	Percentage of HYV	Percentage of irrigated area	Intensity of cropping	Average number of permanent workers	Per acre expenditure on (Rs.)		
							Casual labour	Permanent labour	Total
Progressive									
Medium farmers	120	17·27	24·51	73·7	148	1·43	96·11	57·05	153·16
Large farmers	84	61·26	26·50	57·06	133	4·81	96·78	61·68	158·46
Less progressive									
Medium farmers	82	15·54	5·27	39·32	144	1·15	62·36	39·96	102·32
Large farmers	12	50·00	5·60	33·10	121	2·10	52·00	40·00	92·00

with their less progressive counterparts. The per acre expenditure on labour, both casual and permanent, is more on the progressive farms.

1. Changing Agriculture and Rural Life in a Part of Northern India—Socio-Economic Behaviour of Progressive Farmers in North-West U.P., U.P. Agricultural University and Rockefeller Founation co-operative project.

2. A farmer was classified progressive if he satisfied any three of the following criteria: (*i*) having at least 30 per cent of his sown area under HYV; (*ii*) having at least 20 per cent of his sown area irrigated; (*iii*) having at least 20 per cent of his sown area chemically fertilized; (*iv*) having owned means of irrigation; (*v*) having one agricultural machinery as tractor, thresher, etc.

Table II shows the employment of permanent labour operated area and intensity of cropping on the tractor and the typical farms both in the progressive

TABLE II—OPERATED AREA, INTENSITY OF CROPPING AND NUMBER OF PERMANENT LABOUR ON TRACTOR AND TYPICAL FARMS

Types of farms	Number of culti-vators	Number of farmers with tractor	Percent-age of farmers with tractor	Operated area (acres)		Intensity of cropping		Average number of permanent labour	
				Typical farm	Tractor farm	Typical farm	Tractor farm	Typical farm	Tractor farm
Progressive									
Medium farms	120	24	20	16·42	20·66	146	152	1·40	1·46
Large farms ..	84	48	57	36·79	70·41	119	140	4·30	3·00
Less progressive									
Medium farms	82	6	7	14·03	18·00	155	167	0·80	0·30
Large farms ..	12	6	50	50·60	49·00	135	106	2·10	1·70

and less progressive category. It is seen that in spite of high intensity of cropping and operated area, the number of permanent labour on tractor farms is lower than on the typical farms.

Table III shows the per acre expenditure on labour on the tractor and the typical farms. It is seen that the per acre, expenditure on labour both casual and

TABLE III—COMPARISON BETWEEN TRACTOR AND NON-TRACTOR FARM IN EXPENDITURE PER ACRE FOR CASUAL, PERMANENT AND TOTAL LABOUR : 1967-68

Type of farms	Per acre expenditure on casual labour in (Rs.)			Per acre expenditure on permanent labour in (Rs.)			Total expenditure on labour in (Rs.)		
	Non-tractor	Tractor	Differ-ence	Non-tractor	Tractor	Differ-ence	Non-tractor	Tractor	Differ-ence
Progressive									
Medium ..	98·38	85·18	−13·20	59·09	50·60	−8·49	157·47	135·78	−22·69
Large ..	90·65	81·77	−8·88	58·90	63·29	−4·39	149·55	145·06	− 4·49
Less progressive									
Medium ..	87·00	33·00	−54·00	39·00	28·00	−11·00	126·00	61·00	−65·00
Large ..	59·00	45·00	−14·00	49·00	31·00	−18·00	108·00	76·00	−32·00

permanent is more on the progressive farms. A comparison between the typical and the tractor farm in both the progressive and less progressive category shows that there is a decrease in employment due to mechanization.

Regression Analysis

Regression equations of following type were fitted to examine the impact of bullock labour, technology and farm income on utilization of farm labour on progressive medium and large farms.

$$Y = a + b_1x_1 + b_2x_2 + b_3 x_3$$

where

Y = Human labour days per acre of operated holding.

x_1 = Expenditure on bullock labour per acre of operated holding.

x_2 = Technology (expenditure on HYV, fertilizer and irrigation per acre of operated holding).

x_3 = Farm crop income per acre of operated holding.

b_1.....b_3 are the regression coefficient of respective independent variables.

Simple correlation matrices indicated the absence of high order correlation (multicollinearity) among independent variables.

Table IV shows that bullock labour has significant and positive impact on labour use on these farms.

TABLE IV—REGRESSION COEFFICIENT AND COEFFICIENT OF MULTIPLE DETERMINATION

Type of farms	Intercept	Bullock labour	Tech-nology	Farm income	R^2
Medium	32·4705	0·22474† (·13654)	0·03513 (·04936)	3·64502** (·93669)	0·20
Large	25·8801	0·33586* (·14415)	0·11946** (·04292)	1·66687** (·58274)	0·40

† Significant at 10 per cent level. * Significant at 5 per cent level. ** Significant at 1 per cent level.
Figures in parentheses denote standard error of respective coefficient.

The impact of technology on labour use reflected through HYV, fertilizer and irrigation is positive and significant on large farms only and its coefficient is also quite high. Income shows significant impact on labour use on the farms and its coefficient—being positive—shows that with the increase in income there would be an increase in labour use.

Table V indicates that labour use is more sensitive to changes in bullock labour on medium size farm as compared to that of the large as the level of machinery used in these farms is low. However in the case of technology the sensitivity is more on large farms which means that the level of technology will have a relatively more impact on labour use. It is also seen that labour use is sensitive to changes in crop income on these farms though the sensitivity is higher on medium farms.

TABLE V—ELASTICITY OF LABOUR USE

Type of farms	Bullock labour	Technology	Farm income
Medium	0·17943	0·04595	0·39730
Large	0·15802	0·20141	0·27620

Conclusion

Employment of labour both casual and permanent is higher on the progressive medium and large farms as compared to the less progressive. It is also seen that both on the typical and tractor progressive farms there is greater employment than in the less progressive. Employment on the typical farm per acre is more than that on the tractor farm which shows a decrease in employment due to mechanization. Regression analysis showed that technology and farm income have significant effect on labour use.

IMPACT OF MODERN FARMING TECHNOLOGY ON RURAL EMPLOYMENT IN SAURASHTRA

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INTRODUCTION

The recent spurt in the adoption of modern farming technology, like the use of hybrid seeds, fertilizers, insecticides, irrigation, etc., in certain areas and by certain sections of farmers will have its wide ranging favourable and adverse social, political and economic implications. This paper, however, attempts to find the impact of modern technology on employment. During the two decades of, what is called, planned development, unemployment and illiteracy, in absolute terms, have increased steadily and continuously and we are nowhere near the realisation of the constitutional directives of adequate means of livelihood and education for all children. The problem of unemployment has assumed a menacing dimension and is fraught with dire consequences for all.

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