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EMPLOYMENT GENERATING POTENTIAL OF CAPITAL ON SMALL FARMS

K. V. SUBRAHMANYAM

It has generally been hypothesized that the HYV-based new farm technology has strong land saving and labour absorbing effects. Accordingly a case for additional capital flow to farm sector through new technology is made. This paper attempts to examine the employment generating potential of this additional capital on small farms in the West Godavari District of Andhra Pradesh. The findings of this paper reveal that the employment implications of additional provision of capital would not be uniform in all regions and one needs to be cautioned in pushing ahead with the said approach. Depending upon the agro-climatic conditions and consequent suitability of cropping patterns, additional capital may encourage the capital intensive cash crops on land released from food crops by the adoption of High Yielding Varieties. In such a situation a part of the additional capital made available for High Yielding Varieties would get diverted to capital intensive crops. In view of the recent shortages of crucial inputs and some unfavourable changes in the net profitability of high yielding varieties, this tendency has become more pronounced. Unless this tendency is checked, progress of rural employment through High Yielding Varieties (with additional provision of capital) is likely to be impeded seriously in several areas.

THE factor imbalances indicated by excess labour and scarce land and capital is a well-recognized feature of most farms in India. This understandably injects serious distortions in the resources use pattern and adversely affects the income potential of the farms. In view of the inelastic supply of land, the importance of capital (which

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in the context of high yielding technology can prove land substituting) in reducing the factor imbalances, and effecting resource use reorganization is generally emphasized.¹ The present paper seeks to examine the effects of providing the capital on labour utilization through reorganization of resource use based on the optimum cropping plans (incorporating the new farm technology) developed for the purpose.

The paper focuses its attention on small farms (5 acres and below) because (i) it is this group of farms where greatest imbalance in the existing factor proportioned is witnessed, and (ii) effect of capital on labour utilization on these farms may have marked impact on the rural employment situation in view of the large number of these holdings in India.

The specific objectives of the present study are to:

1. Assess the impact of providing additional capital on the labour use on small farms.
2. To find out the extent to which the high yielding varieties of paddy would help in increasing the labour utilization on the small farms in different agro-climatic conditions.

METHODOLOGY

The study is based on data collected from West Godavari District (A.P.). The district was stratified into eight homogeneous farming zones (see Appendix) on the basis of cropping pattern, soils, irrigation facilities, and production potential. Eight villages were selected randomly one from each farming zone. A random sample of 40 small holdings (below 5 acres), five from each village, were selected for study. The required data for the year 1968-69 were obtained by personal interview through a questionnaire.

Linear programming was used as the analytical technique to assess the labour requirement by developing the optimum plans. The model used was one which maximized net returns from various crops enterprises subject to available resources and maximum acreage restriction under cash crops, minimum cereal requirement for family consumption, and minimum fodder for farm cattle. A crop rotation was considered as an activity and was further divided into a number of processes on the basis of variety, capital requirements, and net returns. In order to estimate the changes in labour utilization, a hiring activity for labour in different periods along with other hiring activities was used in the model.

Eight farming situations were programmed representing the farming zones under the two capital situations: limited available capital, and unlimited capital situation with borrowing activity.

RESULTS

The results of the study are discussed under the two heads: (1) Total utilization of labour in which the overall utilization of labour irrespective of the changes in the individual peak periods of labour use is considered, and (2) the efficiency of labour use, which examines the productivity of the labour in different peak periods in relation to the prevailing wages in different periods and zones.

Total Utilization of Labour

Table 1 presents the utilization of labour under the existing and the two programmed situations, viz., limited capital and unlimited borrowed capital situations.

While the changes in labour use, etc., obtained (through programming) in the limited capital situation reflect the existing mal-allocation of the resources and the scope for improvement therein, the changes obtained in unlimited borrowed capital situation reflect the extent to which the resources can be better utilized with the provision of additional capital. In this process of overall improvement in resource utilization depending upon the ago-climatic condition, actual extent of utilization of individual resource may increase or decrease. The following discussion examines the use of labour as affected by the limited and unlimited capital.

In Zone I, which is characterized by canal irrigation and dominated by paddy and sugarcane crops, the overall utilization of labour has decreased in both the programmed situations compared to the existing use. The extent of decrease was more in unlimited capital situation, nearly 29 per cent compared to 20 per cent in limited capital situations, compared to the existing use. The provision of borrowed funds has not only helped to bring some area under high yielding varieties of paddy but has also helped to increase the area under the capital intensive cash crops such as banana. This has happened because of the high yielding varieties capacity to insure adequate production from lesser area and thereby releasing a part of paddy land for cash crops. This has ultimately reduced the labour demand in the peak periods for paddy crop. Even if the high yielding varieties have increased the demand for labour, as was pointed by many studies,² it was more than offset by the decrease caused by cash crops resulting in overall decrease in utilization. In the limited capital situation, the high yielding varieties could not compete with cash crops in finding a place in the optimum plan due to capital limitation.

In Zones II and III, in which paddy is the most dominating crop and water is available for one season only, the capital borrowing was not found necessary due to limited irrigation facilities. The high yielding varieties could not find place in the optimum plans due to

their poor performance in kharif season compared to local varieties.³ But still the labour utilization has increased due to reorganization of the resources such as following paddy-gingelly rotation, in place of paddy-sunhemp rotation, etc.

In the case of Zone IV, which is a transitional zone between delta and upland, in which both irrigated and unirrigated crops such as paddy, gingelly, and groundnut are important, both the optimum plans have resulted in increased labour utilization. The additional increase of nearly 27 per cent in the unlimited capital plans compared to the limited capital plan was due to bringing in the whole of paddy area under high yielding varieties.

In the case of Zone V, in which 50 per cent of kharif area and 40 per cent of area in rabi is irrigated and is the second best from the gross value of farm production per hectare, the provision of borrowed capital has resulted in decreasing the labour utilization to the extent of nearly six per cent compared to the limited capital plan. This decrease was mainly due to the increase in the area allocated to cash crops as the food requirements were met on a smaller area as the entire area under paddy was allocated to high yielding varieties in the unlimited capital plans. This shows that when adequate credit is provided the farmer may divert a part of the credit for raising capital intensive cash crops which give a higher return than the high yielding varieties. This further shows that in the areas where there are good competitors for high yielding varieties in the form of cash crops, the provision of credit alone may not help unless the total income from the high yielding varieties is substantially high. This may be one of the reasons for the low adoption of the high yielding varieties of paddy in the assured irrigation areas such as deltas.

In the case of Zone VI, in which, besides paddy, tobacco, chillies, and jowar are the important crops, the provision of capital has resulted in increased employment compared to the limited capital plans. As against nearly 20 per cent increase in limited capital plan, the unlimited capital plan has resulted in 34 per cent increase over the existing plans. This increase was mainly due to bringing in additional 46 per cent of cropped area under high yielding varieties. This clearly shows that the high yielding varieties have large potential for increasing labour utilization by bringing more area under high yielding varieties.

In the case of Zones VII and VIII also, which are characterized by tank irrigation, hilly areas and subsistence farming, the unlimited capital plans have resulted in nearly 8 per cent and 37 per cent respectively more employment compared to the limited capital plans. This was also mainly due to bringing the paddy area under high

yielding varieties.

Efficiency of Labour Use

A resource is used efficiently when its use extends to the point where its contribution to the production is equal to the cost of acquiring the same. The contribution of the resource is measured by the marginal value product (MVP). The MVP of labour obtained under the two programmed situations, viz., limited capital and unlimited borrowed capital situation, in the five peak periods of labour use is presented zonewise in Table 2. The prevailing wage rate in these zones is also presented in the same table for comparison. The extent of use of labour and its efficiency is discussed below.

In Zone I, though availability of unlimited capital has resulted in surplus labour in periods I and II, because of the decrease in the paddy area which requires more labour during this period, it has resulted in increased as well as efficient use of labour in periods III, IV, and V⁵ by bringing the MVP to a level almost equal to the prevailing wage rate in the area and thus making economic optimum use of labour.

In Zones II and III, the additional capital was not found necessary and even with the limited capital plans the use of labour was made most efficiently during the periods I and II, though the labour was surplus during the other periods, as evidenced by zero MVP.

In the case of other zones, the general tendency was that the provision of adequate capital had increased labour employment in most of the periods (except periods III and IV in Zones VI, VII, and VIII and period I and in Zone V) and thereby reducing the MVP to the level of hiring charges and thus making use of the labour in most efficient way.

CONCLUSIONS AND POLICY IMPLICATIONS

The present study brings out some important conclusions which may have far-reaching policy implications for employment promotion through additional provision of farm capital.

The general conclusion of several studies cited above is that high yielding varieties-based new farm technology has strong land saving and labour absorbing effects. Accordingly additional capital injected into farm sector through new technology (in terms of additional fertilizers, credit, etc.) besides raising production would add to human employment. This conclusion is supported by the results of the study in the case of upland Zones IV, VI, VII and VIII where there is scope for growing dry crops as well as less capital intensive cash crops and which do not compete with high yielding varieties. In such situations the provision of additional capital not only increases labour

employment but also results in efficient use of labour as revealed by the changes in MVP.

But the study (indicated by results relating to Zones I and V) also suggests that the conclusion of the above type needs to be qualified. In other words, decrease of total labour utilization with additional capital provision in regions such as I and V, where important capital intensive cash crops such as banana compete with food crop paddy, suggests that employment implications of additional provision of capital would not be uniform in all regions. Depending upon the agro-climatic conditions and consequent suitability of cropping patterns, additional capital may encourage capital intensive crops on the released land from food crop, by the adoption of high yielding varieties. In such situations part of the additional capital (in terms of fertilizer, credit, etc.) made available for high yielding varieties would get diverted to capital intensive crops whose labour absorption capacities (compared to high yielding varieties) is very low. In view of the recent shortages of crucial inputs and some unfavourable changes in the net profitability of high yielding varieties due to increased input cost including rise in wages⁶ (in several areas) the possibilities of capital diversion to less labour intensive crops has become more pronounced. Unless this tendency is checked, progress of rural employment through high yielding varieties (with additional provision of capital) in several areas will be seriously impeded. Of course, in the areas where not many competing crops exist, employment prospects may be promoted through additional capital allocation.

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3. Similar findings have been reported by the studies the programme Evaluation Organization of the Planning Commission that during 1969-70 in West Godavari District 20 per cent of the farmers in the villages surveyed used dwarf paddy as kharif crop and 56 per cent as rabi crop. Programme Eva-

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4. During the period activities such as raising paddy nursery, main field preparation and transplantation are taken up.
5. During the period harvesting of kharif paddy, planting of sugarcane, banana, etc., are taken up.
6. R. W. Herdt & E. A. Baker, "Agricultural Wages, Production and the High Yielding Varieties", *Economic and Political Weekly*, Vol. 7, No. 13, 25 March 1972, pp. A23-A30; and C. Muthiah, "The Agricultural Labour Problems in Thanjavur and the New Agricultural Strategies", *Indian Journal of Agricultural Economics*, Vol. 25, No. 3, July-September 1970, pp. 15-23.

Table 1. Human labour utilization on small farms in days (1 day = 8 hrs.)

Zone	Period* Existing Plan	Optimum Plan					Increase/Decrease over Existing Plan					Increase in UC over LC	
		3	4	5	Borrowed Capital (UC)	Limited Capital (LC)	Limited Capital (LC)		Borrowed Capital (UC)		UC over LC		
							Days	%	Days	%	Days	%	Days
1	2	3	4	5	6	7	8	9	10	11			
I	1	60.00	30.00	14.78	(-) 30.00	50.00	(-) 45.22	75.37	(-) 15.22	50.73			
	2	52.00	24.12	15.86	(-) 27.88	53.61	(-) 36.14	69.50	(-) 8.26	34.25			
	3	80.00	97.69	57.86	(+) 17.69	22.11	(-) 22.14	27.67	(-) 39.83	40.77			
	4	61.20	66.34	53.57	(+) 5.14	8.40	(-) 7.63	12.47	(-) 12.77	19.25			
	5	80.00	94.75	94.89	(+) 14.75	18.44	(+) 14.89	18.61	(+) 0.14	0.15			
Total	333.20	312.90	236.96	(-) 20.30	6.09	(-) 96.24	26.88	(-) 75.94	24.27				
II	1	22.50	31.50	—	(+) 9.00	40.00	—	—	—	—			
	2	17.50	31.25	—	(+) 13.75	78.57	—	—	—	—			
	3	37.00	34.15	—	(-) 2.85	7.70	—	—	—	—			
	4	15.00	3.75	—	(-) 11.25	75.00	—	—	—	—			
	5	0.00	12.50	—	(+) 12.50	—	—	—	—	—			
Total	92.00	113.15	—	(+) 21.15	22.99	—	—	—	—	—			
III	1	27.90	30.00	—	(+) 2.10	7.53	—	—	—	—			
	2	15.00	32.08	—	(+) 17.08	113.87	—	—	—	—			
	3	33.00	23.30	—	(-) 9.70	29.39	—	—	—	—			
	4	0.00	10.60	—	(+) 10.60	—	—	—	—	—			
	5	0.00	0.00	—	—	—	—	—	—	—			
Total	75.90	95.98	—	(+) 20.08	26.46	—	—	—	—	—			

(continued)

Table 1. (continued)

Zone	Period* Existing Plan	Optimum Plan		Increase/Decrease over Existing Plan			Increase in UC over LC			
		Limited Capital (LC)	Borrowed Capital (UC)	Limited Capital (LC)		Borrowed Capital (UC)		UC over LC		
				Days	%	Days	%	Days	%	
1	2	3	4	5	6	7	8	9	10	11
IV	1	30.12	31.72	52.80	(-) 1.60	5.31	(+) 22.68	75.29	(+) 21.08	66.46
	2	22.80	35.82	94.36	(+) 13.02	57.10	(+) 71.56	313.86	(+) 58.54	163.43
	3	50.96	45.00	22.00	(-) 5.96	11.69	(-) 28.96	56.83	(-) 23.00	51.11
	4	34.12	34.90	31.90	(+) 0.78	2.29	(-) 2.22	6.51	(-) 3.00	8.60
	5	9.60	52.35	52.80	(+) 42.75	445.31	(+) 43.20	450.00	(+) 0.45	0.86
	Total	147.60	199.79	253.86	(+) 52.19	35.36	+ 106.26	71.95	(+) 54.05	27.05
V	1	24.00	7.14	3.67	(-) 16.86	70.25	(-) 20.33	94.71	(-) 3.47	48.60
	2	12.00	24.00	23.74	(+) 22.83	100.00	(+) 16.74	139.50	(+) 4.74	19.75
	3	50.60	73.43	87.32	(+) 22.83	45.11	(+) 36.72	72.56	(+) 13.89	18.92
	4	44.78	55.38	44.19	(+) 10.60	23.67	(-) 0.59	1.32	(-) 11.19	20.21
	5	52.16	66.07	47.43	(+) 13.91	26.67	(-) 4.73	9.07	(-) 13.64	23.21
	Total	183.20	226.02	211.35	(+) 42.48	23.14	(+) 27.81	15.15	(-) 14.67	6.49
VI	1	50.40	62.96	70.40	(+) 12.56	24.92	(+) 20.00	39.68	(+) 17.44	11.32
	2	52.25	31.57	113.40	(+) 29.32	56.11	(+) 61.15	117.03	(+) 31.83	31.33
	3	56.50	42.64	27.39	(-) 13.86	24.53	(-) 29.11	51.52	(-) 15.25	35.76
	4	1.14	1.75	0.50	(+) 0.61	53.50	(-) 0.64	56.14	(-) 1.25	71.43
	5	6.50	11.55	11.55	(+) 5.05	77.69	(+) 5.05	77.69	0	0
	Total	166.79	200.47	223.24	(+) 33.68	20.19	(+) 56.45	33.84	(+) 22.77	11.36

(continued)

Table 1. (continued)

Zone	Period* Existing Plan	Optimum Plan		Increase/Decrease over Existing Plan			Increase in			
		Limited Capital (LC)	Borrowed Capital (UC)	Limited Capital (LC)	Borrowed Capital (UC)	UC over LC	Days	Days	%	
1	2	3	4	5	6	7	8	9	10	11
VII	1	13.00	41.61	53.40	(+) 23.61	131.16	(+) 35.40	196.66	(+) 11.79	28.33
	2	34.65	71.81	87.30	(+) 37.16	107.24	(+) 52.65	151.94	(+) 15.94	21.57
	3	28.32	25.66	19.17	(-) 2.66	9.59	(-) 9.15	32.31	(-) 6.49	25.29
	4	1.50	23.25	18.42	(+) 21.75	145.00	(+) 16.92	112.80	(-) 4.83	20.77
	5	24.75	34.65	34.65	(+) 9.90	40.00	(+) 9.90	40.00	0	0
Total	107.22	196.98	212.94	(+) 89.76	83.72	(+) 105.72	98.60	(+) 15.96	8.17	
VIII	1	49.50	54.19	79.20	(+) 4.59	9.47	(+) 29.70	60.00	(+) 25.01	46.15
	2	37.58	57.65	119.70	(+) 20.07	53.41	(+) 82.12	218.52	(+) 62.05	107.63
	3	0.00	0.00	27.00	--	--	(+) 27.00	--	(+) 27.00	--
	4	0.00	52.54	0.00	(+) 52.54	--	--	--	(-) 52.54	100.00
	5	0.00	0.00	0.00	--	--	--	--	0	0
Total	87.08	164.38	225.90	(+) 77.50	88.76	+ 138.82	159.41	(+) 61.52	37.43	

* 1 = Mid-May to Mid-June

2 = Mid-July to Mid-August

3 = Mid-November to December

4 = January

5 = April

Table 2. Marginal value product (MVP) of human labour on small farms in West Godavari District (A.P.) (in rupees)

Zone	Period I (Mid May-Mid June)		Period II (Mid July-Mid August)		Period III (Mid Novr.-Mid Decr.)		Period IV (January)		Period V (April)	
	LC	UC	LC	UC	LC	UC	LC	UC	LC	UC
	I	0.28	0.00	14.00	0.00	20.00	5.23	14.00	3.66	20.00
II	5.00	—	3.50	—	0.00	—	0.00	—	0.00	—
III	0.98	—	3.50	—	0.00	—	0.00	—	0.00	—
IV	10.15	5.23	7.10	3.66	0.85	0.00	7.10	3.66	10.15	5.23
V	0	0	6.08	3.16	14.10	4.18	10.27	3.14	14.10	4.18
VI	5.79	3.66	4.14	2.61	0.00	0.00	0.00	0.00	0.00	0.00
VII	5.79	3.66	4.14	2.61	0.00	0.00	0.00	0.00	5.79	3.66
VIII	8.88	3.66	6.34	2.61	0.00	0.00	6.34	0.00	0.00	0.00
Hiring Charges										
Zones I to IV	5.00		3.50						3.50	5.00
Zone V	4.00		3.00						3.00	4.00
Zones VI, VII & VIII	3.50		2.50						2.50	3.50

LC = Limited Capital plans.

UC = Unlimited borrowed Capital plans.