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TABLE VII—ALTERNATIVE PLANS*

	Plan 1	Plan 2	Plan 3	Plan 4
Land fertilized in acres	3.0	2.63	2.29	2.06
Capital used in Rs.	100	100	100	100
Yield obtained in lbs.	4,200	4,208	4,122	4,120
Value of total production in Rs.	1,050	1,052	1,030	1,030
Fertilizer Cost in Rs.	98	100	100	100
Surplus over fertilizer cost in Rs.	952	952	930	930

*Plan—1: Production rate 1400 lbs./acre.
Plan—2: Production rate 1600 lbs./acre.
Plan—3: Production rate 1800 lbs./acre.
Plan—4: Production rate 2000 lbs./acre.

It will be seen from Table VII that the most profitable plan is either plan 1 or plan 2. The total production would be 4,200 pounds and the 'profit' would be Rs. 952. The farmer would be benefited by additional production of 240 pounds of wheat or additional profit of Rs. 60.

Conclusion

It is not necessary to generalize the conclusion from the data which we have used for the sake of illustration only. However, the exercise highlights the need for bringing economics into play while making recommendations to farmers. At present the fertilizer recommendations are prescribed with a view to obtaining maximum production without considering the restriction of availability of capital for fertilizer use. These recommendations sometimes may result in lower production than if the recommendations were based on the assumption of limited capital resources of the farmers.

Secondly, instead of recommending sulphate of ammonia and single superphosphate as the sources of nitrogen and phosphoric acid respectively it is necessary to work out the economics of different fertilizer combinations and the farmer should be advised to use the cheapest source of fertilizers so that he can get maximum profit from his limited capital.

D. K. DESAI* and S. P. DOSHI†

AN APPLICATION OF LINEAR PROGRAMMING FOR FARM PLANNING— A CASE STUDY IN WEST GODAVARI DISTRICT OF ANDHRA PRADESH

Case Study of a Farm

This paper attempts to apply the linear programming technique for determining the optimum crop plan for an individual holding in Nadupalle village in the West Godavari district of Andhra Pradesh.

Farm planning has been in use for a long time in the advanced countries. It is simply the formulation of a plan before hand, only to achieve the economic

* Deputy Director of Agriculture (Stat.), Directorate of Agriculture and Animal Husbandry, Gujarat State, Ahmedabad.
† Directorate of Agriculture and Animal Husbandry, Gujarat State Ahmedabad.

objective of maximizing the net profit. Farm planning arises only where there are some scarce resources, the problem being how best to utilize them, provided they have alternative uses. The procedure ordinarily followed is the conventional budgeting, but of late linear programming has come into existence. There are only few studies which use the linear programming technique to study farm planning problems in India and hence this case study. Further, this note attempts to adopt more realistic constraints. Data for this study have been taken from the Farm Management Investigation for the years 1957-58, 1958-59 and 1959-60. The cultivator has 20 acres of land consisting of 10 acres wet land and 10 acres dry land. The wet land can be used for crops like paddy, sugarcane, plantains whereas the dry land is mainly intended for growing tobacco. The cultivator has grown all the four crops in the three years of investigation and all the four crops are competing with each other either in land or in labour and capital. So the problem is how to allot the resources to the crops keeping in view the objective of maximizing the net income. The linear programming technique requires information of input and output coefficients of each resource used in the crops considered for selection in the programme and the resource supplies. In this study, the three-year averages of the input-output coefficients for all the crops to be considered in the programme are calculated from the Farm Management data on per acre basis. The resource restrictions taken are wet land, dry land, capital in two periods and labour (that of the farmer and his son) in one period. The three-year average working expenses in a particular period of each crop is taken as the capital requirement of that crop in that period. The resource supplies are taken as the corresponding total amounts of resources spent on all the crops because this study is intended how to change, with the existing resources only, the cropping pattern to increase the net income. The net incomes (total income—working expenses) are taken as the prices of the crops. So it should be noted that the maximized net income includes the returns of the fixed capital also. The tabular form of the input-output coefficients, the net incomes and the resource supplies is given below :

Resource	Resource supply	Paddy	Sugar-cane (cane)	Sugar-cane (Jaggery)	Plan-tains	Virginia tobacco
Wet land	.. 10 acres	1	1	1	1	0
Dry land	.. 10 acres	0	0	0	0	1
May-January capital	.. Rs. 3,500	80	450	450	230	130
February-April capital	.. Rs. 3,500	0	270	485	164	160
February-April labour	.. 1,100 hrs.	0	40	111	59	36
Net income ..	.. Rs.	202	637	1,087	365	430

Sugarcane is divided into two processes as the disposal in the form of cane is a different activity to the disposal in the form of jaggery.

The above table has been transformed suitably for linear programming calculations and is given in Table I. (Here the plantain crop is omitted by the method of removing inferior process by calculating the input requirements per

unit of net income and comparing them with those of the other processes. Here they are found to be higher than the corresponding input requirements for the jaggery process.)

It may be noted that P_1 to P_4 are real activities (*i.e.*, crops), P_5 to P_9 are disposal activities (*i.e.*, resources), C's are the net incomes for different activities. The Z-row gives the value of all activities which must be sacrificed to obtain one unit increase in the new activity and thus C—Z gives the amount by which profit will be increased if one unit increase is made in the new activity. [(Z—C) is given in the table to conform to the standard procedure. So the activity with most negative value will be the most profitable crop to be included.]

The first feasible plan is that where all the crops are at the zero level and all the resources are at the levels of the resource supplies. The Z—C row shows that, the maximum negative value —1087 is under sugarcane (jaggery) and so the most profitable crop to be included in the programme is sugarcane (jaggery). The disposal activity to be replaced is February-April capital, as 3000/485 is the smallest ratio (*i.e.*, the February-April capital is the most limiting resource for the crop). The calculations are carried to determine the new levels of the activities previously included in the programme and again the Z—C row is calculated. The figure under the supply level column and against Z—C row gives the net income accrued from that second feasible plan.

But as the Z—C row shows still negative values there is possibility of increasing the net income further more and looking at the Z—C row, paddy crop is to be included next, by replacing the disposal activity wet land, since land is the most limiting resource for paddy (because 3.8144/1 is the minimum ratio). The calculations are carried till Z—C row shows no negative value. This is the case with the 4th stage in Table I. There are no negative values in Z—C row, denoting that no profit could be added furthermore. The net income derived is Rs. 8,874.64. This is the maximum possible income that can be acquired under the given circumstances.

The optimum plan shows that the level attached to P_1 is 7.11, to P_4 is 10 and P_3 is 2.89, *i.e.*, paddy crop should be grown in 7.11 acres, tobacco in 10 acres and sugarcane (jaggery) in 2.89 acres. The three resources replaced by these three crops are completely exhausted and they are wet land, dry land and February-April capital. The resources that remain in surplus in this optimum plan are May-January capital and February-April labour. Incidentally the figures under the disposal columns against Z—C show the marginal productivities of the resources used. In Table I the marginal productivity of an acre of wet land is Rs. 202, that of an acre of dry land is Rs. 138.04 and that of February-April capital is Rs. 1.82 (*i.e.*, if one more acre of wet land is added to the resource supply it will increase the net income by Rs. 202, etc.). For May-January capital and February-April labour there are zeros because surplus remains in these two resources. So the net income can be calculated from the marginal productivities also by multiplying the marginal productivities of the factors by their corresponding resource supplies.

$$202 \times 10 + 138.04 \times 10 + 1.82487 \times 3000 = 8875.02$$

TABLE I

		C	202	637	1087	430	0	0	0	0	0
Cs	Resource	Supply level	Real activities				Disposal activities				
			Paddy P_1	Sugarcane (cane) P_2	Sugarcane (jaggery) P_3	Virginia Tobacco P_4	Wet Land P_5	Dry Land P_6	May-Jan. capital P_7	Feb.-April capital P_8	Feb.-April labour P_9
0P	Wet land .. P_5	10	1	1	1	0	1	0	0	0	0
0	Dry land .. P_6	10	0	0	0	1	0	1	0	0	0
0	May-Jan. cap. .. P_7	3500	80	450	450	130	0	0	1	0	0
0	Feb.-Apr. cap. .. P_8	3000	0	270	485	160	0	0	0	1	0
0	Feb.-Apr. lab. .. P_9	1100	0	40	111	36	0	0	0	0	0
	Z ..	0	0	0	0	0	0	0	0	0	0
	Z—C ..	0	—202	—637	—1087	—430	0	0	0	0	0
0	.. P_5	3.8144	1	0.4433	0	—0.3299	1	0	0	—0.002062	0
0	.. P_6	10	0	0	0	1.0000	0	1	0	0	0
0	.. P_7	716.4944	80	199.4846	0	—18.4537	0	0	1	—0.927900	0
1087	.. P_3	6.1856	0	0.5567	1	0.3299	0	0	0	0.002062	0
0	.. P_9	413.4020	0	—21.7938	0	—0.6186	0	0	0	—0.228882	1
	Z ..	6723.7124	0	605.1340	1087	358.5980	0	0	0	2.241394	0
	Z—C ..	6723.7124	—202	—31.8660	0	—71.4020	0	0	0	2.241394	0
202	.. P_1	3.8144	1	0.4433	0	—0.3299	1	0	0	—0.002062	0
0	.. P_6	10	0	0	0	1	0	1	0	0	0
0	.. P_7	411.3398	0	164.0206	0	7.9381	—80	0	1	—0.762940	0
1087	.. P_3	6.1856	0	0.5567	1	0.3299	0	0	0	0.002062	0
0	.. P_9	413.4020	0	—21.7938	0	—0.6186	0	0	0	—0.228882	1
	Z ..	7494.2277	202	694.6804	1087	291.9588	202	0	0	1.824870	0
	Z—C ..	7494.2277	0	57.6804	0	—138.0412	202	0	0	1.824870	0
202	.. P_1	7.1134	1	0.4433	0	0	1	0.329897	0	—0.002062	0
430	.. P_4	10	0	0	0	1	0	1	0	0	0
0	.. P_7	331.9587	0	164.0206	0	0	—80	—7.938110	1	—0.762940	0
1087	.. P_3	2.8866	0	0.5567	1	0	0	—0.329897	0	0.002062	0
0	.. P_9	419.5876	0	—21.7938	0	0	0	0.618567	0	—0.228882	1
	Z ..	8874.6392	202	694.6804	1087	430	202	138.041155	0	1.824870	0
	Z—C ..	8874.6392	0	57.6804	0	0	202	138.041155	0	1.824870	0

whereas the net income calculated from the programming table is Rs. 8,874.64.

This can be used as a check also.

Integration of Non-Farm Activity into Farming

It is seen above that the May-January capital and February-April capital remained in surplus. It is worthwhile to utilize them possibly in a non-farm activity and derive some more income. Actually the cultivator under study has a business enterprise which requires some working capital and some amount of his labour. So this can be added to the programming computations to derive a more optimum plan for his crops as well as non-farm business combined together. So in Table II the non-farm business has been added as a new column, besides the four crops included, and the programming calculations have been carried.

The optimum plan shows when compared to the previous optimum plan that a slight reduction in the sugarcane acreage (0.48 acres) will allow the non-farm business to expand to 3.66 times the original size besides the utilization of the reduced 0.48 acres for growing paddy crop. In this process of change the net income increases to Rs. 9,456.14, an increase of about Rs. 582 over the previous plan. Here the only resource that remains in surplus is the May-January capital. Looking at the marginal productivities of the resources used (under disposal activities against Z—C row) we see that the wet land has Rs. 202, the dry land has Rs. 139, the February-April capital has Rs. 1.56 and February-April labour has Rs. 1.39. Since the land and labour are almost fixed, it would be better if a search is made whether the February-April capital can be increased because an additional rupee of capital will add Rs. 1.51 to the income.

Utilization of Incomes Generated in the Middle of the Plan

The particular cultivator under study and the cultivators in general hold on the paddy, whose yields are derived in January, till the prices rise in April or May. But if the paddy is disposed of in January itself and if the income derived is used in further production, a change in the crop pattern can be brought about to make the plan more profitable. This is worked out in Table III. Here it is assumed that the whole paddy crop will be disposed of in January and the income derived is used in the next period for production. Accordingly in the linear programming—282 is added under paddy against February-April capital denoting that if one acre of paddy is produced it will *add* (that is why minus sign should be added) Rs. 282 to the February-April capital. Except for this change, everything else remains same and the linear programming computations are carried on as usual. The optimum plan shows a net income of Rs. 10,044.62, an increase of Rs. 588 over the second optimum plan (in Table II). This plan allots 6.61 acres to paddy, 3.39 acres for production of sugarcane to prepare jaggery and to increase the size of the non-farm business activity to 2.88 times the existing scale. Here it is interesting to note that surplus of Rs. 1,472 of February-April capital remains. This denotes that if all the paddy crop is sold in January itself, the income created for the February-April period will be in excess of what is required for the optimum plan. In fact all the paddy may not be disposed. Some quantity would be kept for the cultivator's home consumption. The remaining, still if in

TABLE II

		C	202	637	1087	430	259
			Real Activities				
C_s	Resource	Supply level	P_1	P_2	P_3	P_4	P_5
			Paddy	Sugarcane (Cane)	Sugarcane (Jaggery)	Virginia Tobacco	Non-farm Business
1		2	3	4	5	6	7
0	Wet land	P_6 10	1	1	1	0	0
0	Dry land	P_7 10	0	0	0	1	0
0	May-Jan. cap.	P_8 3500	80	450	450	130	50
0	Feb.-Apr. cap.	P_9 3000	0	270	485	160	50
0	Feb.-Apr. lab.	P_{10} 1100	0	40	111	36	126
	Z	0	0	0	0	0	0
	Z—C	0	—202	—637	—1087	—430	—250
0		P_6 3.8144	1	0.4433	0	—0.3299	—0.1031
0		P_7 10	0	0	0	1	0
0		P_8 716.4944	80	199.4846	0	—18.4537	3.6082
1087		P_3 6.1856	0	0.5567	1	0.3299	0.1031
0		P_{10} 413.4020	0	—21.7938	0	—0.6186	114.5567
	Z	6723.7124	0	605.1340	1087	358.5980	112.0621
	Z—C	6723.7124	—202	—31.8660	0	—71.4020	—137.9379
202		P_1 3.8144	1	0.4433	0	—0.3299	—0.1031
0		P_7 10	0	0	0	1	0
0		P_8 411.3398	0	164.0206	0	7.9381	11.8556
1087		P_3 6.1856	0	0.5567	1	0.3299	0.1031
0		P_{10} 413.4020	0	—21.7938	0	—0.6186	114.5567
	Z	7494.2277	202	694.6804	1087	291.9588	91.2373
	Z—C	7494.2277	0	57.6804	0	—138.0412	—158.7627
202		P_1 4.8165	1	0.4237	0	—0.3305	0
0		P_7 10	0	0	0	1	0
0		P_8 368.5565	0	166.2755	0	8.0021	0
1087		P_3 5.8135	0	0.5763	1	0.3305	0
250		P_5 3.6087	0	—0.1902	0	—0.0054	1
	Z	8067.1560	202	664.4755	1087	291.1018	250
	Z—C	8067.1560	0	27.4755	0	—138.8982	0
202		P_1 7.4910	1	0.4237	0	0	0
430		P_4 10	0	0	0	1	0
0		P_8 288.5352	0	166.2755	0	0	0
1087		P_3 2.5090	0	0.5763	1	0	0
250		P_5 3.6627	0	—0.1902	0	0	1
	Z	9456.1381	202	664.4755	1087	330	250
	Z—C	9456.1381	0	27.4755	0	0	0

TABLE II (*Contd.*)

			C	0	0	0	0	0
				Disposal Activities				
C_S	Resource		Supply level	P_6	P_7	P_8	P_9	P_{10}
				Wet Land	Dry Land	May-Jan. Capital	Feb.-April Capital	Feb.-April Labour
				8	9	10	11	12
0	Wet land	P_6	10	1	0	0	0	0
0	Dry land	P_7	10	0	1	0	0	0
0	May-Jan. cap.	P_8	3500	0	0	1	0	0
0	Feb.-April cap.	P_9	3000	0	0	0	1	0
0	Feb.-April lab.	P_{10}	1100	0	0	0	0	1
	Z		0	0	0	0	0	0
	Z—C		0	0	0	0	0	0
0		P_6	3.8144	1	0	0	—0.002062	0
0		P_7	10	0	1	0	0	0
0		P_8	716.4944	0	0	1	—0.927900	0
1087		P_3	6.1856	0	0	0	0.002062	0
0		P_{10}	413.4020	0	0	0	—0.228882	1
	Z		6723.7124	0	0	0	2.241394	0
	Z—C		6723.7124	0	0	0	2.241394	0
202		P_1	3.8144	1	0	0	—0.002062	0
0		P_7	10	0	1	0	0	0
0		P_8	411.3398	—80	0	1	—0.762940	0
1087		P_3	6.1856	0	0	0	0.002062	0
0		P_{10}	413.4020	0	0	0	—0.228882	1
	Z		7494.2277	202	0	0	1.824870	0
	Z—C		7494.2277	202	0	0	1.824870	0
202		P_1	4.8165	1	0	0	—0.002268	0.000900
0		P_7	10	0	1	0	0	0
0		P_8	368.5565	—80	0	1	—0.739253	—0.103487
1087		P_3	5.8135	0	0	0	0.002268	—0.000900
250		P_5	3.6087	0	0	0	—0.001998	0.008729
	Z		8067.1560	202	0	0	1.507680	1.385750
	Z—C		8067.1560	202	0	0	1.507680	1.385750
202		P_1	7.4910	1	0.330454	0	—0.002268	0.000900
430		P_4	10	0	1	0	0	0
0		P_8	288.5352	—80	—8.002130	1	—0.739253	—0.103487
1087		P_3	2.5090	0	—0.330454	0	0.002268	—0.000900
250		P_5	3.6627	0	0.005400	0	—0.001998	0.008729
	Z		9456.1381	202	138.898210	0	1.507680	1.385750
	Z—C		9456.1381	202	138.898210	0	1.507680	1.385750

TABLE III

		C	202	637	1087	430	259
			Real Activities				
Cs	Resource	Supply level	P_1	P_2	P_3	P_4	P_5
			Paddy	Sugarcane (Cane)	Sugarcane (Jaggery)	Virginia Tobacco	Non-farm Business
1		2	3	4	5	6	7
0	Wet land	P_6 10	1	1	1	0	0
0	Dry land	P_7 10	0	0	0	1	0
0	May-Jan. Cap.	P_8 3500	80	450	450	130	50
0	Feb.-April Cap.	P_9 3000	—282	270	485	160	50
0	Feb.-April Labour	P_{10} 1100	0	40	111	36	126
	Z		0	0	0	0	0
	Z—C	0	—202	—637	—1087	—430	—250
0		P_6 3.81443	1.58144	0.44330	0	—0.32990	—0.10309
0		P_7 10	0	0	0	1	0
0		P_8 716.49350	341.64800	199.48500	0	—18.45500	3.60950
1087		P_3 6.18557	—0.58144	0.55670	1	0.32990	0.10309
		P_{10} 413.40173	64.53984	—21.79370	0	—0.61890	114.55701
	Z		—632.02528	605.13290	1087	358.60130	112.05883
	Z—C	6723.71459	—834.02528	—31.86710	0	71.39870	—137.94117
0		P_6 0.49788	0	—0.48009	0	—0.24447	—0.11979
0		P_7 10	0	0	0	1	0
202		P_1 2.09717	1	0.58389	0	—0.05402	0.01056
1087		P_3 7.40495	0	0.89620	1	0.29849	0.10923
0		P_{10} 278.05071	0	—59.47787	0	2.86808	113.87547
	Z		202	1092.11518	1087	313.54659	120.86613
	Z—C	8472.80899	0	455.11518	0	—126.45341	—129.13387
0		P_6 0.79037	0	—0.54266	0	—0.24145	0
0		P_7 10	0	0	0	1	0
202		P_1 2.07139	1	0.58941	0	—0.05429	0
1087		P_3 7.13824	0	0.95325	1	0.29574	0
250		P_5 2.44171	0	—0.52231	0	0.02519	1
	Z	8788.11516	202	1024.66607	1087	316.80030	250
	Z—C	8788.11516	0	387.66607	0	—113.19970	0
0		P_6 3.20487	0	—0.54266	0	0	0
430		P_4 10	0	0	0	1	0
202		P_1 2.61429	1	0.58941	0	0	0
1087		P_3 4.18084	0	0.95325	1	0	0
250		P_5 2.18981	0	—0.52231	0	0	1
	Z	9920.11216	202	1024.66607	1087	330	250
	Z—C	9920.11216	0	387.66607	0	0	0
0		P_9 1472.42031	0	—249.31545	0	0	0
430		P_4 10	0	0	0	1	0
202		P_1 6.60573	1	—0.08643	0	0	0
1087		P_3 3.39427	0	1.08643	1	0	0
250		P_5 2.88275	0	—0.63964	0	0	1
	Z	10044.61645	202	1003.58005	1087	330	250
	Z—C	10044.61645	0	366.58055	0	0	0

TABLE III (*Contd.*)

		C	0	0	0	0	0
			Disposal Activities				
C_5 Resource		Supply level	P_6	P_7	P_8	P_9	P_{10}
			Wet Land	Dry Land	May-Jan. Capital	Feb.-April Capital	Feb.-April Labour
			8	9	10	11	12
0 Wet land	P_6	10	1	0	0	0	0
0 Dry land	P_7	10	0	1	0	0	0
0 May-Jan. cap.	P_8	3500	0	0	1	0	0
0 Feb.-April cap.	P_9	3000	0	0	0	1	0
0 Feb.-April lab.	P_{10}	1100	0	0	0	0	1
Z			0	0	0	0	0
Z—C		0	0	0	0	0	0
0	P_6	3.81443	1	0	0	—0.00206186	0
0	P_7	10	0	1	0	0	0
0	P_8	716.49350	0	0	1	—0.92783700	0
1087	P_3	6.18557	0	0	0	0.00206186	0
	P_{10}	413.40173	0	0	0	—0.22886646	1
Z			0	0	0	2.24124182	0
Z—C		6723.71459	0	0	0	2.24124182	0
0	P_6	0.49788	1	0	—0.00462886	0.00223297	0
0	P_7	10	0	1	0	0	0
202	P_1	2.09717	0	0	0.00292699	—0.00271577	0
1087	P_3	7.40495	0	0	0.00770187	0.00048280	0
0	P_{10}	278.05071	0	0	—0.18890747	—0.05359110	1
Z			0	0	2.44118467	—0.02378194	0
Z—C		8472.80899	0	0	2.44118467	—0.02378194	0
0	P_6	0.79037	1	0	—0.00482758	0.00217660	0.00105194
0	P_7	10	0	1	0	0	0
202	P^1	2.07139	0	0	0.00294451	—0.00271080	—0.00009273
1087	P^3	7.13824	0	0	0.00188307	0.00053420	—0.00095921
250	P^5	2.44171	0	0	—0.00165889	—0.00047061	0.00878152
Z		8788.11516	0	0	2.22696561	—0.08455870	1.13398727
Z—C		8788.11516	0	0	2.22696561	—0.08455870	1.13398727
0	P_6	3.20487	1	0.24148	—0.00482758	0.00217660	0.00105194
430	P_4	10	0	1	0	0	0
202	P_1	2.61429	0	0.05429	0.00294451	—0.00271080	—0.00009273
1087	P_3	4.18084	0	—0.29574	0.00188307	0.00053420	—0.00095921
250	P_5	2.18981	0	—0.02519	—0.00165889	—0.00047061	0.00878152
Z		9920.11216	0	113.19970	2.22696561	—0.08455870	1.13398727
Z—C		9920.11215	0	113.19970	2.22696561	—0.08455870	1.13398727
0	P_9	1472.42031	459.43215	110.94368	—2.21794546	1	0.48329506
430	P_4	10	0	1	0	0	0
202	P_1	6.60573	1.24543	0.35501	—0.00306790	0	0.00121739
1087	P_3	3.39427	—0.24543	0.35501	0.00306790	0	—0.00121739
250	P_5	2.88275	0.21621	0.02702	—0.00270268	0	0.00900896
Z		10044.61645	38.84695	122.57115	2.03942150	0	1.17484985
Z—C		10044.61645	38.84695	122.57115	2.03942150	0	1.17484985

excess may be held till the price is increased to a favourable level. Another interesting feature that may be noted in this plan is that in going from the last but one phase of the programme to the last phase, it can be seen that the disposal activity February-April capital replaced the disposal activity wet land. This means that instead of keeping 3.20 acres of land as idle, it would fetch more (about Rs. 124) to utilize all the land and keep the February-April capital idle.

Conclusions

In the first plan, when only the crops are considered, it is found that the 10 acres of wet land is divided into 7.11 acres for paddy and 2.89 acres for sugarcane (jaggery) and 10 acres of dry land for tobacco.

In the second plan, when the non-farm business activity is also integrated with the crop plan, it is found that reducing 0.48 acres of sugarcane in favour of paddy would make the non-farm activity expand to 3.66 times the existing level, increasing the net income by Rs. 582.

In the third plan, keeping the non-farm business activity in the plan and using the incomes generated in the middle of the plan to crops still continuing, it is found that the acreage under sugarcane (jaggery) can be increased to 3.39 acres, reducing simultaneously the acreage under paddy to 6.61 acres and non-farm activity to 2.88 times the existing level but increasing the net income further by Rs. 588. In the last stage it is seen that keeping capital idle, instead of land is more profitable. This seems fully valid because all the income generated in the middle may not be used for the plan as some quantity of paddy may be kept for home consumption and in that case the surplus capital will be reduced to insignificance.

D. RADHAKRISHNA*

FARMER CHARACTERISTICS ASSOCIATED WITH THE ADOPTION AND DIFFUSION OF IMPROVED FARM PRACTICES

Intensive efforts are made to motivate the farmers to increase the production by adopting improved farm practices since the inception of the "Grow More Food Campaign" during the Second World War. Despite these efforts and the theoretical and practical justifications for improved farm practices it has been observed by extension workers that these practices are not followed by all farmers.

This note makes an attempt to explore (1) the relationship of selected personal and socio-economic characteristics of farmers to the adoption of improved farm practices ; and (2) the extent to which these farmers are reached by various communication media for adoption of improved farm practices.

Method of Study

Data for this study were secured by personal interview method from a total of 106 farmers of Bhadravati National Extension Service Block in the Chanda district in Maharashtra State during the summer of 1958. This random sample

*Research Officer, Farm Management Studies, Andhra University Waltair (A.P.).