A PLAN FOR ALLOCATION OF CULTIVABLE LAND AMONG DIFFERENT ECONOMIC CROPS OF KERALA STATE

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Cropping pattern plays a very important role in building up the economy and agricultural income of any state. Commercial crops occupy an important place in the economy of Kerala State. More than 48% of the total cropped area of the state is growing commercial crops and about 51% are producing cereals and pulses. The objective of the present study is to draw up a plan for reallocation of cultivable land among the different economic crops subject to the conditions: (1) 2/3rd of the food requirements of the state should be met from within; (2) the net income from agriculture should be maximum, (3) the gross income from agriculture must be above the present level for the crops included in the study and (4) production from none of the food and cash crops should go below 80% of the 1960-61 level of their production. The third constraint has been put in to see that the cost of inputs especially labour would not register a decrease due to action taken on the basis of this study. Such a macro-economic study would be important specially at this juncture when the state has met with an unprecedented food crisis. The stipulation that 2/3rd of the food requirements of the state must be met from within, has been introduced in this context. At the present moment, Kerala is producing only about 50% of its requirement of cereals, pulses and root crops. If we can increase this contribution by 15 to 16% in the next five years, it will be a good achievement in the field of food production. The present study is geared to this need.

The materials for the study have been taken from different sources. They are given in tables 1, 2 and 3 appended. From the land utilization statistics of Kerala for the year 1956-57, it is observed that about one-fourth of the total area is under forests. This area cannot be reclaimed for cultivation as it will affect the rainfall and the other meteorological conditions of the state. The cultivable

waste which constitutes about 4.6% of the total area can readily be brought under cultivation. Permanent pastures (1.3%) cannot be brought under cultivation as this will adversely affect the bovine population and hence the milk yield of the state. The areas under tree crops which constitute about 5.4% cannot be directed to other crops. Of the fallow lands, the current fallows (1.7%) will be under cultivation in subsequent years. But the permanent fallows (2.2%) cannot be brought under the plough. Hence for reallocation of land among the different competitive crops, we are mainly using the information regarding the total cropped area from table I published by the Directorate of Economics and Statistics, Ministry of Food & Agriculture, Government of India for the year 1960-61.

From this table it is seen that paddy which accounts for about 37% of the total cropped area is the major crop of Kerala State. The average yield of paddy in the state is one of the highest in India. Coconut is the next major crop of the state. It covers more than 23% of the total cropped area which constitutes about 72% of the area under coconut in the Indian Union. Kerala tops the list of coconut producing states of the Indian Union by contributing about 75% of the total production of coconuts in the country. Rubber and pepper occupy respectively 6% and 5% of the total cropped area of the state and their productions are respectively 96% and 98% of the total production in the Indian Union. The production of cashewnut in Kerala State is observed to be 72% of the all India production. The state produces 50% and 60% of the all India productions of arecanut and cardamom respectively. The whole of lemon grass and 66% of ginger produced in India, come from Kerala.

Nature of Soil in the State :

An important feature of this study is that the reallocation of land under different crops has been made according to the various types of soils in the state. Table 2 gives the percentages of area under different types of soils in each district of the state. More than 53% of the soil in the state is under the laterite veriety, 17% under alluvial type, 21% under sandy and the rest under clayee type. In addition, according to topography the land in Kerala can be classified into the following three types :

(a) High land which consists of mostly forest areas, where the annual rainfall is between 100" to 200". Plantation crops like tea, rubber and cardamom are raised in these areas. The area under high land is about 45% of the total area of the state.

(b) Mid-land which covers about 37% of the total area, is mostly a long, narrow belt of river valleys where annual rainfall ranges from 55″ to 155″. The crops grown in these areas are mainly paddy, tapioca, coconut, pepper and ginger. On hill slopes rubber is also grown.

(c) Low land constitutes about 18% of the total area. The annual rainfall in this region is between 35″ and 140″. Paddy and coconut are the main crops in these areas.

The present study is carried out by using linear programming techniques. One of the limitations for the application of the theory of linear programming under the Indian farming conditions is that reliable estimates of cost of cultivation for all the different crops are not available, for surveys on cost of cultivation have been conducted on only a few crops in selected areas. The estimates of net income from different crops cannot hence be calculated with any reasonable degree of precision. Th se estimates are also subject to the fluctuating price situations obtaining in the country. However, we were successful in getting some reasonable estimates of these for nine crops of the state. The estimates of gross and net incomes for arecanut, pepper, tea, coffee and cardamom were obtained from the Additional Director, Bureau of Economics and Statistics, Trivandrum. These figures were estimated on the basis of the average farm prices for the years 1954-64. The farm prices for the individual years were not available with us and hence these estimates could not be made on the basis of the most recent years. The gross and net incomes for other crops have been calculated from the prices of the commodity concerned and the approximate cost of cultivation of each crop as published by the Director of Agriculture, Kerala and the Directorate of Economics and Statistics, Ministry of Food and Agriculture, Government of India. The net income per acre varies from Rs. 50 for tapioca to Rs. 1,088 for arecanut. These estimates for the respective crops are shown in table 3. Since these statistics were available only for 9 crops, the present study is confined to these crops alone. The crops considered for the study cover about 4,380 thousand acres of cultivated land which is about 84% of the cropped area. From table 3, it is seen that the most economic crops of the state are arecanut, tea, coffee, pepper and cocouut in that order. Coconut crop is relegated to a secondary position when judged from the net income per acre. But from the point of view of total production and total income (about 41 crores of rupees per annum) the crop stands out as the most important crop of the state. But the

areas under tea, coffee, etc. are non-overlapping with the areas under coconut and arecanut. Hence reallocation of land is tried in crops where the areas are overlapping and not in crops where the areas are non-overlapping.

For making a more useful allocation of cultivable land under different crops, it is assumed in the present context that at least a major portion of the food required for the state, must be produced in the state itself. Thus we introduce the constraint that the cultivated land in the state should be reallocated in such a way that at least 2/3rd of the food required for the state is produced from within. A reliable estimate of total population of the state is required in order to work out its food requirements. The total population of Kerala was estimated to be 1,69,03,715 in 1961 Population census. The annual increase in the population over the 1951 Census figure was observed to be 2.476%. Assuming that the population increases in geometrical progression during intercensal periods, the total population of the state in 1964 was estimated to be 1,81,90,668. In order to have an idea about the total requirements of cereals for the state, it is essential to know the requirements of each person per day, under a balanced diet. A balanced diet is defined as one which contains the different types of foods in such quantities and proportions that the need for calories, minerals, vitamins and other nutrients are adequately met and a small provision is made for extra nutrients to withstand short durations of leanness. The different items of food and their quantities required under a balanced diet are given by the Nutrition Research Laboratories, Hyderabad in their special report series No. 42. It is observed that 14 oz. of cereals and 3 oz. of root vegetables are required by a normal adult per day. In Kerala, as elsewhere in the country, it is very difficult for a common man to get all the items required in a balanced diet. Moreover, it is very difficult to change the food habits of the people. Hence the calorie requirements of the common man in the state are mainly to be met from cereals and root crops. From the consumption habits of an average individual in the state, it is assumed that, on an average, 24 oz. of cereals and root crops will be required per head per day in the state. Working on the energy value of this quantum of cereals and root crops, it is found that it will supply about 2,300 calories per day per individual. The deficit in the calorie requirements can be made up from the supplementary foods available in the state. Hence the above requirement is quite reasonable. On this assumption, the total yearly requirements of cereals and root crops for the state work out to be 4,446 thousand tons.

An estimate of the additional production of rice by the application of fertilizers by the farmers can be worked out by using the "Yardsticks" of additional production prepared by the Indian Council of Agricultural Research. Since nitrogen and green manures are better nutrients of paddy crop, the additional production of rice that can be achieved by the application of economic levels of these have been worked out. The additional production of rice after the application of nitrogen at 20 lbs. per acre and green manuring at 5,000 lbs per acre is estimated to be 2,07,975 tons and 203 tons. This forms about 4.7% of the total cereal and root crops requirements of the state. The total requirement of cereals and root crops for the state after making allowance for additional production that can be achieved from the application of nitrogen and green manuring at the stipulated doses, works out to be 4,238 thousand tons. In the present study, the provision has been made to reallocate the area under the nine different crops in such a way that 70% of the above requirements would be met by this change.

The distribution of area under different crops for various soil types has been estimated from the percentage areas under each soil type given in table 2. The areas under different crops under different types of soil along with the gross income are given in table 4. In this table the gross income has been computed from the areas under the different crops and gross income per acre given in table 3. The production target has been apportioned under each soil type in proportion to the present food crop production under that type of soil. The areas under each crop under the different soil types have been worked out approximately by the assumption that they were distributed among the different soil types in which they were occurring in proportion to the percentage area under that soil type. For instance the total area under paddy which occurs in alluvial, sandy and clayee soils has been apportioned among these soils in the ratio 16.58 : 20.82 : 9.11.

An attempt has been made to allocate the area under different crops in different types of soil separately. Allocation under each soil type has been made in order to maximise the net income from all the crops in that soil subject to the condi ions that the food crop production and gross incomes for the soil type should not be less than the respective figures given in columns 6 and 5 of table 4 and the production of none of the important crops should be less than 80% of the level obtaining in 1960-61. These restrictions have been imposed to obtain at least 2/3rd of the food grain and tapioca (root

crop) required without any reduction in the gross income. The constraint regarding gross income has been introduced to ensure that the wages of agricultural labour which form a sizeable portion of the cost of cultivation will not go below the present level. We shall assume that according to the new allocation under each soil type, areas under different crops will be redistributed as given below :—

Crop	*Area in '000 acres*
Paddy	X_1
Sugarcane	X_2
Coconut	X_3
Arecanut	X_4
Tapioca	X_5
Pepper	X_6
Cardamom	X_7
Coffee	X_8
Tea	X_9

(*a*) *Alluvial Soil*

Crops considered in this type of soil are paddy, sugarcane, coconut and arecanut. The following inequalities are obtained:

$$x_1+x_2+x_3+x_4 \leqslant 1184 \quad \ldots(1)$$

$$307x_1+640x_2+530x_3+1208x_4 \leqslant 510389 \quad \ldots(2)$$

$$1181x_1 \geqslant 887622 \quad \ldots(3)$$

$$2800x_3 \geqslant 976640 \quad \ldots(4)$$

and $543x_4 \geqslant 20417$ ...(5)

Constraint (1) places the restriction that the total reallocated area must be less than or equal to the total area under the four crops considered. Constraint (2) gives the inequality for the gross income and constraint (3) that for food crop production. Constraints (4) and (5) stipulate that the production of coconut and arecanut should not fall below 80% of the respective productions of 1960-61. The problem is to maximise the objective function $100x_1+125x_2+330x_3+1088x_4$ ...(6) which gives the net income from the different crops under the soil type. Expression (6) is to be maximised subject to

the conditions laid down in inequalities (1) to (5). The linear programming solution of the problem by simplex method has been obtained and presented in table 5. According to this programme the areas under paddy, coconut and arecanut work out to be 752, 349 and 83 thousand acres respectively. Paddy is coming out as the most important crop by virtue of the constraint regarding food production. Area under arecanut increases in the programme because of the high net income per acre. Since the proportionate area and net income per acre under sugarcane are relatively low, it can be replaced by paddy, arecanut or coconut. Area under coconut is reduced from 436 to 339 thousand acres predominantly due to the constraint relating to the food production.

(*b*) *Sandy Soil*

In the sandy soil the major crops are paddy, coconut, arecanut, tapioca and pepper. For finding the optimum allocation under these crops the objective function $100x_1+330x_3+1088x_4+50x_5+471x_6$ is to be maximised subject to the conditions

$$x_1+x_3+x_4+x_5+x_6 \leqslant 1723 \quad \ldots (7)$$

$$307x_1+530x_3+1208x_4+138x_5+523x_6 \geqslant 689522 \quad \ldots (8)$$

$$1181x_1+6237x_5 \geqslant 2399178 \quad \ldots (9)$$

$$2800x_3 \geqslant 1227520 \quad \ldots (10)$$

$$280x_6 \geqslant 17248 \quad \ldots (11)$$

$$543x_4 \geqslant 25630 \quad \ldots (12)$$

$$1181x_1 \geqslant 805915 \quad \ldots (13)$$

and $$6237x_5 \geqslant 928066 \quad \ldots (14)$$

The solution by simplex method gives the areas under paddy and tapioca respectively as 683 and 256 thousand acres. The area under paddy decreased by 170 thousand acres in spite of the constraint regarding production. Areas under coconut, arecanut and pepper work out to be 439, 283 and 62 thousand acres respectively. There is a decrease in area under coconut and pepper. These have gone in favour of arecanut which register an increase from 59 to 283 thousand acres. This can be attributed to the high net income per acre obtaining in the case of arecanut. The reduction of 15 thousand acres seen in the case of pepper can go either to arecanut or tapioca. Thus we see that the marginal land under paddy, coconut and pepper where the net returns are small, can be converted to arecanut or tapioca in this type of soil.

(*c*) *Clayee Soil*

The crops considered in clayee soil type of areas are paddy, coconut, arecanut and sugarcane. The objective function to be maximised is

$$100x_1+125x_2+330x_3+1088x_4$$

subject to the conditions

$$x_1+x_2+x_3+x_4 \geqslant 687 \quad \ldots(15)$$
$$307x_1+640x_2+530x_3+1208x_4 \geqslant 296885 \quad \ldots(16)$$
$$1181x_1 \geqslant 513747 \quad \ldots(17)$$
$$2800x_3 \geqslant 566720 \quad \ldots(18)$$
$$543x_4 \geqslant 12164 \quad \ldots(19)$$

The solution by simplex method gives the areas under paddy, coconut and arecanut as 436, 203 and 48 thousand acres respectively. Because of the high net income that arecanut is fetching, the programming tells us that it is economic to increase the area under arecanut by 20 thousand acres more. Since the proportionate area and net income per acre under sugarcane are relatively small, it can be replaced by arecanut or paddy. There is a reduction of 50 thousand acres under coconut as indicated by the programme. This shows that such areas which are not quite suitable for coconut, can be converted to areca or paddy depending on the moisture conditions of the soil. Further, it would be better if the coconut plantations are grown mixed with arecanut.

(*d*) *Laterite Soil*

Crops considered in this tract are tapioca, pepper, cardamom, coffee and tea. These are mainly cash crops. The objective function to be maximised is $50x_5+471x_6+300x_7+620x_8+853x_9$ subject to the conditions

$$x_5+x_6+x_7+x_8+x_9 \leqslant 786 \quad \ldots(20)$$
$$138x_5+523x_6+412x_7+875x_8+2171x_9 \geqslant 412736 \quad \ldots(21)$$
$$6237x_5 \geqslant 2844339 \quad \ldots(22)$$
$$280x_6 \geqslant 37856 \quad \ldots(23)$$
$$40x_7 \geqslant 2240 \quad \ldots(24)$$
$$263x_8 \geqslant 8837 \quad \ldots(25)$$
$$\text{and } 845x_9 \geqslant 62868 \quad \ldots(26)$$

Solving the above problem by simplex method, we get the areas under tapioca and tea respectively as 456 and 105 thousand acres. Areas under pepper, caradamom and coffee have been reduced by 34, 14 and 8 thousand acres respectively by the programme. Thus it is seen that these crops are not as economic as tea. Tapioca gets a prominent place in the picture by virtue of the constraint regarding food production. It is seen from the results that those of the cardamom plantations which are uneconomic can slowly be replaced by tea plantations depending on the elevation of the place. Of the coffee plantations, those uneconomic plantations whose topography is better for tea may be replanted with tea and those whose topography is suitable for tapioca may be converted to the cultivation of that crop. The uneconomic pepper gardens can be converted to tapioca.

Discussion and Conclusions

The proposed areas under different crops worked out on the basis of the present study are given in table 5. We are getting this picture from the present constraints. If the constraints be altered, the solutions may also differ considerably. From the programming adopted here it is seen that the area under paddy decreases from 1925 to 1871 thousand acres. This decrease is due to the reduction of area in the sandy soil. In fact the programming shows an increase of paddy area by 73 and 43 thousand acres respectively under alluvial and clayee types of soils. Thus by allocating more area for paddy under alluvial and clayee soils and reducing the area under paddy in sandy soil to the extent shown in table 5, it is possible to increase food production by at least 10%. This shows that by judicious choice of proper crops in proper soils it is possible to increase production substantially. The areas under sandy soil which do not produce economic yield of paddy can go to arecanut or tapioca.

Again from table 5 we find that the area under coconut should be reduced by 246 thousand acres. Even if the reduction be made to this extent in area, the total production will not be reduced by more than 20% of the 1960-61 production. Examining in detail we find that this reduction is to be made in alluvial, sandy and clayee soils. The uneconomic coconut plantations can be converted to arecanut, tapioca or paddy lands. Since the area under arecanut is to be increased from 134 to 414 thousand acres, the recommendation that we can make under the present analysis is to convert the part of the area under sugarcane in alluvial and clayee soils to this crop. The rest of the areas can come from the uneconomic coconut gardens and paddy fields. Part of the area under sugarcane in alluvial soil can go to paddy crop.

Sugarcane thus gets eliminated out of the programming by virtue of two factors namely (1) there is proportionately very small area under this crop in the state and (2) the net income is low as compared to the other competitive crops. From table 5 we find that the area under tapioca is to be increased from 598 to 712 thosand acres. This increase can come from the marginal pepper, cardamom or coffee gardens under laterite soil or the marginal pepper, coconut or paddy lands in sandy soil. This increase ensures that the food production of the state will be achieved to the extent of 2/3rd of the present requirements. Assuming that the average level of production per acre of the tapioca to remain the same as in the year 1960-61, the increase in the production of tapioca under this programme is worked out to be about 19%. But paddy shows a decrease of about 2.7% under similar assumptions. But the production per acre of paddy is known to be more under alluvial soil and hence the overall production is apt to exceed the 1960-61 level provided this factor is taken into account. Since no primary data are available to demonstrate this, we have to assume that the worst that can happen under the present programme is to reduce the paddy yield by 2.7%.

From table 5 it is again seen that the area under pepper is to be reduced by 49 thousand acres. This is due to the constraint relating to the production and the relative position that pepper occupies in the schedule for net income. Coming to the high land crops, mainly cardamom, coffee and tea, we see that the area under tea is to be increased at the expense of the areas under cardamom and coffee. This is due to the high net income per acre fetched by tea. It is also important to point out that about 45% of the foreign exchange comes from tea. In this context, we would also like to point out that the present programming will not adversely affect the foreign exchange position of the country. On the basis of available data relating to production, export trade and internal consumption in the foreign exchange earning commodities *viz.* tea, coffee, pepper and cardamom, we have worked out the money values of the exportable portion of these commodities for Kerala State before as well as after programming. The results showed that the decrease registered by coffee, pepper and cardamom under the programming would be more than compensated by the increase in the tea production. The relevant data are shown in table 6.

There are many limitations to the present study. First of all, data on cost of cultivation of all the crops are not available. It is also to be noted that areas under different soil types were worked out

approximately. Again the prices used for calculating the net income per acre were the averages for the years 1954-61. This may vary considerably from the presant price situation obtaining in the country. It is admitted that more macro-economic data are required for obtaining more authentic results. In spite of all these limitations, we can venture to state that at least over 10% increase on the present level of food production can be achieved if we change the cropping pattern according to the broad recommendations made in this study. This is under the assumption that the yield levels will remain the same as the present per acre yield of the crop. But the chance is that the actual gain in yield that can be attained by the programme is much more than 10% because (i) the average yield of paddy will be more under alluvial and clayee types of soils than sandy soil and (ii) the average yield of tapioca is apt to be more in sandy soil. By uniform application of fertilizers at 20 lbs. of nitrogen per acre and green manuring at 5,000 lbs. per acre to the paddy crop we can get an increase in food production to the tune of 7.8% of the present level. This is over and above the increase of over 10.8% that can be attained by redistribution of areas under different crops according to the programme presented in this paper.

By the reallocation of area as recommended in the present study, we can increase the net income from agriculture by more than 19%. The gross income under the optimum situations will register an increase of 9%. This income will further increase if mixed gardens of coconut and arecanut are grown.

The present study under the stipulated constraints can be used as a broad basis for taking suitable administrative actions for improving the agricultural economy of the state. In the first instance we have to increase the area under tapioca, arecanut and tea. The area can further be increased by reclaiming the culturable waste, current fallows and other fallows. In order to increase food production more area is to be brought under tapioca which is an important food crop of the state. For a healthy development of the economy it is better to produce a major portion of the food requirements of the state from within the state itself. It is with this objective that the constraint regarding food production has been introduced in the study. Under the present reallocation scheme it is possible to increase the yeild of paddy and root crops in the state by about 10% in addition to an increase in net income from the nine crops studied to the tune of 19% of the present level. The reason why the programming is not quite favourable to coconut is that the yield per adult

tree *viz.* 34 nuts (vide Ref. 10) and hence the net income per acre is relatively not as high as compared to the other economic crops. It can also be suggested that if more cereals are to be produced, the economic paddy growing fields should not be converted to other crops especially coconut. More detailed collection of data and examination of the problem under various other constraints are left out for further investigation. It may also be stated that if this type of study be extended to the other states it will help to increase the agricultural production and improve the national income from agriculture.

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TABLE 1

Area, average yield and production of different crops in Kerala (1960-1961)

Crops	*Area in '000 acres*	*Percentage to total cropped area of the state*	*Average yield (lbs/acre)*	*Production ('000 tons)*	*Percentage of all India production*
1. Rice	1925	36 9	1181	1,015	4·2
2. Coconut	1,237	23·7	2,800*	3,464,720@	74·0
3. Tapioca	598	11·5	6,237	1,666	81·0
4. Rubber	304	5 8	271	37	96·0
5. Pepper	246	4·7	280	31	98·0
6. Cashewnut	134	2 6	1,349	81	72·0
7. Arecanut	134	2·6	543	32	50·0
8. Total pulses	109	2·1	350	17	1·5
9. Banana	110	2·1	6563	322	30 0
10. Tea	93	1·8	845	35	13 0
11. Cardamom	71	1·4	40	1	60 0
12. Coffee	42	0·8	263	5	25·0
13. Lemon grass	40	0·8	—	—	100·0
14. Groundnut	40	0·8	910	16	0·1
15. Sugarcane	35	0·7	3620	57	0·5
16. Other Cereals (Millets)	32	0·6	560	8	—
17. Ginger	30	0·6	890	12	66·0
18. Cotton	20	0·4	156	1	—
19. Turmeric	12	0·2	783	4	3·0
Total	5212	—	—	—	—

*Average yield is in terms of nuts per acre.

@Production is in terms of thousand nuts.

Source : (1) Directorate of Economics and Statistics Ministry of Food and Agriculture, Government of India.

(2) M. S. Randhawa—*Farmers of India*—Vol. II.

TABLE 2

Soil Classificatian of Kerala

District	*Percentage of area under the soil*				
	Alluvial	*Sandy*	*Clayee*	*Laterite*	*Total*
Trivandrum	27·16	12·96	3·96	55·92	100·00
Quilon	59·37	17·73	7 67	15·23	100·00
Alleppey	31·63	38·62	19·21	10·54	100·00
Kottayam	11·21	2·32	2·72	83·75	100·00
Trichur	21·65	25·73	25·35	27·27	100·00
Palghat	—	13·53	14·71	71·76	100·00
Kozhikode	4·28	33·22	9·92	52·58	100 00
Cannanore	3·81	24·00	0·81	71·38	100·00
State	16·58	20·82	9·11	53·49	100·00

Source : Department of Statistics, Government of Kerala.

TABLE 3

Estimates of gross and net income of different Crops in Kerala

Crops	*Gross income (Rs./acre)*	*Net income (Rs./acre)*
1. Paddy	307	100
2. Sugarcane	610	125
3. Coconut	530	330
4. Arecanut	1,208	1,088
5. Tapioca	138	50
6. Pepper	523	471
7. Cardamom	412	300
8. Coffee	875	620
9. Tea	2,171	853

Source : Bureau of Economics and Statistics, Kerala.

TABLE 4

Cropwise area under different soils and gross income from the nine important crops in Kerala

Soil type	*Total area ('000 acres)*	*Crops*	*Area under different crops ('000 acres)*	*Gross income from all crops (in Rs.)*	*⅔rd of required production of rice & tapioca ('000 lb.*
1. Alluvial Soil	1,561	1. Paddy	679	510389	887622
		2. Sugarcane	22		
		3. Coconut	436		
		4. Arecanut	47		
2. Sandy Soil	1,960	1. Paddy	853	689522	2399178
		2. Coconut	548		
		3. Tapioca	186		
		4. Arecanut	59		
		5. Pepper	77		
3. Clayee Soil	904	1. Paddy	393	296885	513747
		2. Coconut	253		
		3. Arecanut	28		
		4. Sugarcane	13		
4. Laterite Soil	5,034	1. Pepper	169	412736	2844339
		2. Tapioca	412		
		3. Cardamom	70		
		4. Coffee	42		
		5. Tea	93		

TABLE 5

Area under different crops in Kerala as at present and as proposed

Crops	*Area in thousand acres*									
	Alluvial Soil		*Sandy Soil*		*Clayee Soil*		*Laterite Soil*		*Total*	
	A	*B*	*A*	*B*	*A*	*B*	*A*	*B*	*A*	*B*
1. Paddy	679	752	853	683	393	436	—	—	1,925	1871
2. Sugarcane	22	—	—	—	13	—	—	—	35	—
3. Coconut	436	349	548	439	253	203	—	—	1,237	991
4. Arecanut	47	83	59	283	28	48	—	—	134	414
5. Tapioca	—	—	186	256	—	—	412	456	598	712
6. Pepper	—	—	77	62	—	—	169	135	246	197
7. Cardamom	—	—	—	—	—	—	70	56	70	56
8. Coffee	—	—	—	—	—	—	42	34	42	34
9. Tea	—	—	—	—	—	—	93	105	93	105

A=area at present. B=area as proposed.

TABLE 6

Table showing the effect of programming on the foreign exchange position of the country

Crop	Production ('000 lbs:)		Consumption in Kerala ('000 lbs.)	Extra after consumption ('000 lbs.)		Value ('000 Rs) of extra products		Price (Rs./lb.)
	Before Programming	After programming		Before programming	After programming	Before programming	After programming	
Tea	78585	88725	11490*	67095	77235	185182	213169	*2·76
Coffee	11046	8942	2656*	8390	6286	12753	9555	*1·52
Pepper	68880	55160	1888	66992	53272	85750	68188	†1·28
Cardamom	2840	2240	117	2723	2123	22301	17387	†8·19
Total value of exportable portions.						(305986)	(308299)	

Source—1. *Tea Statistics, Tea Board 1961 and 1962.

2. *Coffee in India, 1959-60.

3. †Indian Agricultural Price Statistics—1961-62.

4. †Statistical abstract of the Indian Union. 1962, 63, 64,