CREDIT NEEDS FOR MANURING COCONUT PALMS IN KERALA *

Introduction

Production of coconuts in India is proposed to be raised by about 18 per cent during the Fourth Plan period. For this purpose, the main emphasis, among others, is on increased use of fertilizers and manures. The purpose of this study is to assess the credit requirements for purchase of fertilizers and to provide some guidelines for determination of the period of repayment of loans advanced for this purpose by the co-operatives and other credit institutions.

In view of this objective, the study covers the following three aspects: Firstly, the technical aspects like the manurial practices with reference to the recommended doses of fertilizers/manures to be applied, time-lag between application of fertilizers and resultant additional yield, factors assisting sustenance of high level of yields attained, *etc.*, secondly, economics of coconut cultivation with particular reference to expenditure on application of fertilizers and manures and, thirdly, the present loan policy of the co-operatives in respect of coconut cultivation. The plan of enquiry was broadly divided into three parts. Firstly, information on technical aspects was collected (through a mailed questionnaire) from a few agencies connected with coconut research and development like the Central Coconut Research Station, Director of Agriculture, Government of Kerala, and E.I.D. Parry & Company. Secondly, a quick field enquiry was conducted for the study of economics of coconut cultivation with 1966-67 as the reference year. Thirdly, information on the present co-operative loan policy and procedures was collected from the Apex Co-operative Bank of Kerala and the Central Co-operative Banks of Alleppey and Kozhikode districts. This study is based on the statistical and other information collected through these sources and the discussions held with a number of knowledgeable officials and non-officials.

SECTION I
OBJECTIVES AND METHODOLOGY

Objectives

The main purpose of this investigation is to find out the amount of expenditure incurred on fertilizers and manures and its proportion to total expenditure on coconut cultivation and to assess the amount of credit required for this purpose by the different classes of coconut growers and its relation to their total credit requirements. In the light of the data on farm business of these cultivators, the study aims at providing some broad guidelines for fixation of repayment period of loans advanced for this purpose; the aim is not to arrive at any statistical estimates. The present study is confined to the existing coconut palms for manuring of which at present short-term production loans are advanced by the co-operatives. It does not cover the credit requirements for expansion of and/or addition to the existing plantations or for plantation of fresh coconut gardens as medium-term and long-term loans are provided by the co-operatives for these purposes.

Selection of Districts

It was decided to confine the study to two districts in Kerala State. As the manurial practices followed were somewhat different in the Travancore and the Malabar regions of the State, it was decided to select one district each from these two regions. Taking into account the extent of area under coconut in the different districts in these two regions, Alleppey and Kozhikode districts were selected for the purpose of investigation.

As shown in Table 1, the area under coconut in Alleppey district at 1.80 lakh acres, besides being the second highest in terms of actual acreage, accounted for the largest proportion (46.20 per cent) of the net area sown in the district. In Kozhikode district the area under coconut at 2.41 lakh acres, which was the largest amongst the different districts, accounted

* Prepared by V. M. Jakhade and A. P. Kurian in the Division of Rural Economics of the Economic Department.

REPRINTED FROM THE SEPTEMBER 1969 ISSUE OF THE RESERVE BANK OF INDIA BULLETIN

TABLE I

DISTRICT-WISE AREA UNDER COCONUT IN KERALA (Average of Years 1958-59 to 1960-61)

District	Area under coconut (in lakh acres)	Col. 2 as proportion to net area sown in the district	Col. 2 as proportion to total area under coconut in the State
(1)	(2)	(3)	(4)
Trivandrum	1.38	38.01	11.43
Quilon	1.50	29.24	12.38
Alleppey	1.80	46.20	14.87
Kottayam	1.43	20.93	11.85
Ernakulam	1.05	21.68	8.70
Trichur	0.87	28.13	7.20
Palghat	0.45	7.65	3.75
Kozhikode	2.41	31.14	19.95
Cannanore	1.19	21.03	9.87
Total	12.08	25.84	100.00

Source: Season and Crop Reports, Kerala State.

for 31 per cent of the net sown area in the district.

Another aspect taken into consideration for selection of districts which is very much relevant to the present enquiry, was the extent of the use of fertilizers/manures for coconut cultivation. Though detailed data on the quantum of coconut manure mixtures supplied were not available, data relating to Coconut Manure Loans provided by the Government through co-operatives (discussed in detail in Section III), were available, which it was thought, would provide a broad indication of the extent of use of fertilizers for coconut cultivation. The coconut manure loans outstanding at the end of June 1967 with the Central Cooperative Banks in Kozhikode and Alleppey districts were Rs. 3.77 lakhs and Rs. 3.73 lakhs, respectively; in the ranking of district central co-operative banks according to outstandings of these loans they stood third and fourth, respectively. As regards the extent of use of manure, no data were available. However, discussions with the concerned officials indicated that in both the districts manuring of coconut was extensively practised.

Selection of Villages and Cultivators

The objective of the study required identifying villages where not only coconut was cultivated extensively but where manuring of coconut was practised on a fairly large scale, so that a sample of cultivators who used fertilizers / manures for a continuous period of two to three years, could be selected for a detailed enquiry. The procedure followed for selection of villages and coconut growers for investigation was as under. As data on the issue of fertilizers for coconut cultivation were not available, village-wise or even block-wise, the other available indicators, namely, the quantum of coconut manure loans and short-term loans for coconut cultivation advanced by the co-operatives were taken into consideration. On the basis of credit society-wise data on amounts of coconut manure loans drawn from the district co-operative banks, the credit societies which borrowed such loans for a period of three years consecutively were first identified in each of the two selected districts. From among these societies, a separate list of those which borrowed relatively large amounts of short-term loans for coconut cultivation was prepared and from among such societies, one society was selected for each district after ascertaining the general characteristics of coconut cultivation, manuring practices, *etc.* Within the jurisdiction of each of the two selected credit societies, one village in which manuring of coconut was found to be relatively more prevalent was selected. The villages selected were Kandalur in Kayamkulam *taluq* of Alleppey district and Eramala in Badgara *taluq* of Kozhikode district. From each of two selected villages, a list of cultivators who had used fertilizers/manures for a continuous period of two to three years was prepared and from the cultivators thus listed a sample of 20 cultivators was selected at random. Thus, the number of cultivators studied totalled 40.

SECTION II

ECONOMICS OF COCONUT CULTIVATION

Some Salient Features of Coconut Cultivation

Before proceeding with an analysis of the farm business data collected in respect of the

selected coconut cultivators, it may be useful to indicate some of the special features of coconut cultivation. Generally, a coconut cultivator is not a coconut grower only. He cultivates more than one crop, namely, paddy, coconut, arecanut, tapioca, plantain, *etc.* Thus, a part of his holding is put under paddy and the rest under other crops. There are two types of cropping units in respect of these other crops:

(a) Gardens or plantations growing coconut only, and

(b) Mixed cropping units growing coconut and other crops like arecanut, tapioca, plantain, *etc.*

As may be seen from Table II, the average size of cultivated holding for the selected cultivators was 3.04 acres in Kandalur (District Alleppey). Of this, coconut was exclusively grown on 0.54 acre accounting for 18.0 per cent of the total cultivated holding. Of the remaining, coconut and other crops were grown on 1.17 acres forming 38.0 per cent of the total cultivated holding. The remaining area of 1.33 acres was under paddy.

TABLE II

SIZE OF CULTIVATED HOLDINGS OF SELECTED CULTIVATORS AND DISTRIBUTION OF AREA ACCORDING TO CROPS CULTIVATED

(Area in acres per household)

Village	Coconut only		Mixed cropping units (coconut with other crops*)		Paddy		Total cultivated holding
	Area	Proportion to total holding	Area	Proportion to total holding	Area	Proportion to total holding	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Kandalur	0.54	18.0	1.17	38.0	1.33	44.0	3.04
Eramala	1.83	66.5	0.14	5.0	0.78	28.5	2.75

* Other crops include tapioca, arecanut and plantain.

In Eramala (District Kozhikode), though a similar pattern was observed, the proportion of area exclusively under coconut at 66.5 per cent was larger and that of the area under mixed cropping units was relatively smaller.

After planting, a coconut palm takes eight to ten years to bear fruits; thereafter, it continues to bear fruits upto the age of 60 years and even later. Of course, the yield varies according to the age of a palm. Generally, when a palm crosses 40 years of age, with the advancing age, the number of nuts it bears decreases. A study of coconut plantations according to age-distribution of palms shows that unless the entire area has been newly planted, a plantation generally consists of trees of different age-groups — some young, some bearing, some non-bearing, some old, *etc.* Data collected in respect of the selected cultivators showed that the average number of trees per acre was 111 in Kandalur and 60 in Eramala. Of these, the fruit bearing trees accounted for 78 per cent in both the villages (Table III). The remaining 22 per cent included mostly trees which have not yet reached the bearing stage. The implication of this is that though the current farm expenditure has to be incurred on *all* the trees, on an average, 78 per cent of trees generate current income.

TABLE III

DISTRIBUTION OF COCONUT PALMS: BEARING AND NON-BEARING

Village	Average number of trees per acre	of which			
		Bearing		Non-Bearing	
		Number	Proportion to total	Number	Proportion to total
(1)	(2)	(3)	(4)	(5)	(6)
Kandalur	111	87	78.4	24	21.6
Eramala	60	47	78.3	13	21.7

A notable feature of coconut cultivation is that nuts are harvested more than once in a year at varying intervals. The frequency differs from one locality to another. On the holdings of the selected cultivators, the average number of times coconuts were harvested worked out to six in a year. Thus, unlike other crops, coconut cultivators get cash receipts from sale of nuts almost throughout the year, generally with an interval of two months. The yield, however, does not remain uniform at all the six pluckings. Generally, two harvests during the period January-April give higher yields as compared with the four harvests during the period May to December; the yield being the lowest for the pluckings during June-July.

Size of Cultivated Holdings

Table IV presents frequency distribution of the selected cultivators according to size of cultivated holding under all crops. It may be seen that the average size of cultivated holding per household worked out to 3.04 acres in Kandalur and 2.75 acres in Eramala. Of the selected cultivators in both the villages, between 50 per cent and 55 per cent had cultivated holdings between 2 and 5 acres and a little more than one-third had less than two acres.

TABLE IV

DISTRIBUTION OF SELECTED CULTIVATORS' AREA ACCORDING TO SIZE OF CULTIVATED HOLDING

Size Group	Kandalur				Eramala			
	No. of house-holds	Total area under all crops (acres)	Area under coconut (acres)	No. of palms*	No. of house-holds	Total area under all crops (acres)	Area under coconut (acres)	No. of palms*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Below 2 acres	7	5.82	3.58	528 (75)	7	7.50	7.00	409 (58)
2—5 acres	10	33.50	18.12	2025 (203)	11	30.50	18.55	1234 (112)
5—10 acres	3	21.50	12.50	1265 (422)	2	17.00	11.00	560 (280)
All	20	60.82	34.20	3818	20	55.00	36.55	2203
Average		3.04	1.71	(191)		2.75	1.83	(110)

* Figures in brackets are palms per cultivating household.

As regards the area under coconuts covering both the area put exclusively under coconut as well as area under coconut in mixed cropping units, the average per household worked out to 1.71 acres in Kandalur and 1.83 acres in Eramala. Out of 20 cultivators selected in each village, as many as 19 cultivators in the former and 18 in the latter had area under coconut varying from 14 cents to 3.50 acres. The remaining one cultivator in the former and two in the latter village had an area exceeding 5 acres under coconut. As regards the palms per household, the number was more in Kandalur than in Eramala in respect of all the three size-groups, the average per household being 191 in the former and 110 in the latter village.

Gross Value of Farm Produce

The gross value of farm produce is arrived at by taking into account both the main farm products and by-products valued at the farm harvest prices.* The by-products of coconuts are leaves used for thatching purposes and

* The farm harvest prices relate to the year 1966-67 and were Rs. 50 per 100 nuts of coconut, Rs. 3 per 100 nuts of arecanut, Re. 1 per bunch of plantain, Rs. 20 and Rs. 30 per quintal of tapioca in Kandalur and Eramala respectively; for paddy, the prices were Rs. 100 per quintal in the former and Rs. 95 per quintal in the latter village.

other materials used largely as fuel. The average gross value of produce per household covering all crops grown worked out to Rs. 3,878 in Kandalur and Rs. 2,470 in Eramala. Coconut accounted for 57 per cent of the gross value of all crops per household in the former and 67 per cent in the latter village (Table V).

TABLE V
GROSS VALUE OF PRODUCE PER HOUSEHOLD

(Amount in rupees)

Village	Coconut		Other crops (arecanut, tapioca and plantain)		Paddy		Gross value
	Value	Proportion to gross value	Value	Proportion to gross value	Value	Proportion to gross value	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Kandalur	2,225	57.4	169	4.3	1,484	38.3	3,878
Eramala	1,658	67.1	158	6.4	654	26.5	2,470

Mixed crops grown in coconut gardens, *viz.*, tapioca, arecanut and plantain contributed 4 per cent of the gross value per household in Kandalur and 6 per cent in Eramala. Arecanuts are harvested three to four times in a year, and tapioca once in a year. In view of the fact that an average coconut grower also cultivates arecanut, paddy and tapioca the number of times he receives income from the sale of farm output in a year is larger as compared with cultivators who grow one or two crops. This fact has an important bearing on determination of repayment schedule for loans for the coconut cultivator.

Data on the gross value of coconut and other crops on a per acre basis are presented in Table VI. The gross value of coconut per acre worked out to Rs. 1,300 in Kandalur and Rs. 907 in Eramala. In mixed cropping units the gross value per acre, *i.e.*, the value of coconuts and other crops grown together amounted to Rs. 1,399 in Kandalur and Rs. 924 in Eramala, respectively. In the case of paddy, the gross value per acre worked out to Rs. 1,115 in the former and Rs. 833 in the latter village.

TABLE VI
GROSS VALUE OF PRODUCE PER ACRE

(Amount in rupees)

Village	Coconut	Mixed cropping units (including value of other crops)	Paddy	All crops
(1)	(2)	(3)	(4)	(5)
Kandalur	1,300	1,399	1,115	1,275
Eramala	907	924	833	898

Age-Composition and Yield of Trees

The average yield of coconut per acre worked out to 2,530 nuts in Kandalur and 1,757 nuts in Eramala. The yield level depends on a number of factors such as soil fertility, type of fertilizers / manures used, variety of coconut grown, density per acre and age-composition of palms. There was no significant difference in the variety of trees as between the two villages.

It has been indicated earlier that on an average 78 per cent of the trees in a garden were of the fruit bearing age and that the level of yield varied according to the age of palms. Table VII presents data on age-composition and yield of coconut palms in the gardens of the selected cultivators. In Kandalur, coconut palms start bearing fruits from the eighth year and in Eramala from the tenth year. Thenceforth as the palms advance in age

the annual yield also increases reaching the peak between the age of 20-40 years; thereafter it declines. The largest number of trees was aslo found in the age group 20-40 years. Trees in this age group gave the highest yield, accounting for 52 and 64 per cent of the total yield per acre in Kandalur and Eramala, respectively. Palms over 60 years of age yielded a few nuts in the former but not in the latter village.

The average annual yield of nuts per tree worked out to 23 in Kandalur and 29 in Eramala. If the bearing trees alone are considered, the average yield came to 29 in the former and 37 in the latter village. As between the different age-groups also, the average yield per tree was lower in Kandalur than in Eramala. Though a number of factors influence the yield the lower level of yield in Kandalur is attributed chiefly to two factors, *viz.*, higher density of palms per acre and larger incidence of pests and diseases. Normally density between 60 and 80 trees per acre is not considered harmful from the point of healthy growth of palms. As against this, the selected cultivators in Kandalur had, on an average, 111 trees per acre. This over-crowding of trees depresses the yield. Secondly, unlike in Eramala, coconut palms in Kandalur have been affected by diseases like bud rot, leaf rot, *etc.* In fact, the spread of diseases is a major problem confronting expansion of coconut cultivation in the Travancore region.

TABLE VII

DISTRIBUTION OF PALMS ACCORDING TO AGE AND YIELD

(Per acre)

Village	Age group	No. of trees	Proportion to total	Yield of nuts (total)	Proportion to total	Average yield per tree
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Kandalur						
	0 — 8	24	21.6	—	—	—
	8 — 10	8	7.2	126	5.0	15.8
	10 — 15	9	8.1	155	6.1	17.2
	15 — 20	16	14.4	457	18.1	28.6
	20 — 40	34	30.6	1312	51.9	38.6
	40 — 60	18	16.2	448	17.7	24.9
	Over 60	2	1.8	32	1.3	16.0
	Total	111	100.0	2530	100.0	22.8 (29.1)
Eramala						
	0 — 8	10	16.7	—	—	—
	8 — 10	3	5.0	—	—	—
	10 — 15	1	1.7	26	1.5	26.0
	15 — 20	9	15.0	261	14.9	29.0
	20 — 40	27	45.0	1132	64.4	41.9
	40 — 60	10	16.7	338	19.2	33.8
	Over 60	—	—	—	—	—
	Total	60	100.0	1757	100.0	29.3 (37.4)

Figures in brackets refer to the average yield per bearing tree.

Current Farm Expenditure

Current farm expenditure included cash and kind expenses incurred on the following items: (i) Seedlings, (ii) Fertilizers, (iii) Manures, (iv) Pesticides, (v) Draught power, (vi) Payments to hired labour, (vii) Land revenue, (viii) Irrigation charges, (ix) Rent, (x) Repairs to farm implements, (xi) Customary payments, *etc.* As irrigation water was not used for co-

conut cultivation in the two selected villages, no expenditure on this item was reported.

The current farm expenditure per household worked out to Rs. 1,759 in Kandalur and Rs. 1,013 in Eramala. Of this expenditure, coconut garden accounted for nearly 60 per cent in the former and 57 per cent in the latter village followed by paddy with 37 and 36 per cent, respectively.

TABLE VIII

CURRENT FARM EXPENDITURE PER HOUSEHOLD

(Amount in rupees)

Village	Coconut		Other crops in coconut garden		Paddy		Total expenditure
	Expenditure	Proportion to total	Expenditure	Proportion to total	Expenditure	Proportion to total	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Kandalur	1,051	59.7	63	3.6	645	36.7	1,759
Eramala	579	57.2	73	7.2	361	35.6	1,013

On a per acre basis, current farm expenditure showed considerable variation between the two villages. The expenditure per acre of coconut garden worked out to Rs. 617 in Kandalur as against Rs. 318 in Eramala. In mixed cropping units, the expenditure per acre was Rs. 655 and Rs. 326, respectively (Table IX).

TABLE IX

CURRENT FARM EXPENDITURE PER ACRE

(Amount in rupees)

Village	Coconut	Mixed cropping units including other crops in coconut garden	Average expenditure per coconut tree	Paddy	All crops
(1)	(2)	(3)	(4)	(5)	(6)
Kandalur	617	655	5.56	486	579
Eramala	318	326	5.30	458	368

The variation in the current farm expenditure per acre as between the two villages may be attributed chiefly to the difference in the density of trees per acre. As already stated, the average number of trees per acre was higher at 111 in Kandalur as against 60 in Eramala. The average expenditure per tree worked out to Rs. 5.56 in Kandalur and Rs. 5.30 in Eramala.

TABLE X

CURRENT FARM EXPENDITURE, GROSS VALUE OF PRODUCE AND FARM BUSINESS INCOME

(Per acre)

Item—Villagewise	Coconut	Mixed cropping units	Paddy
(1)	(2)	(3)	(4)
Proportion of Current Farm Expenditure to Gross Value of Produce			
Kandalur	47.5	46.8	43.6
Eramala	35.1	35.3	55.0
Farm Business Income*			
Kandalur	Rs. 683	Rs. 744	Rs. 629
Eramala	Rs. 589	Rs. 598	Rs. 375

* Gross value of produce *less* Current farm expenditure.

Table X presents data on the current farm expenditure as proportion to the gross value of produce on a per acre basis. In respect of coconut gardens, the current farm expenditure accounted for nearly 48 per cent of gross value of produce in Kandalur and 35 per cent in Eramala. In the case of mixed cropping units, this proportion came to 47 per cent and 35 per cent and in the case of paddy to 44 per cent and 55 per cent, respectively. The farm business income defined as gross value of produce *less* the current farm expenditure worked out to Rs. 683 per acre and Rs. 589 per acre of coconut garden in Kandalur and Era-

mala, respectively. In mixed cropping units, it amounted to Rs. 744 in the former and Rs. 598 in the latter village. This income was relatively lower in respect of paddy.

TABLE XI

FARM BUSINESS INCOME PER HOUSEHOLD AND PER ACRE OF CULTIVATED HOLDING —ALL CROPS

(Amount in rupees)

Item	Kandalur	Eramala
(1)	(2)	(3)
Per Household		
(1) Gross value of produce	3,878	2,470
(2) Current farm expenditure	1,759 (45.4)	1,013 (41.0)
(3) Farm business income (1-2)	2,119	1,457
Per Acre of Cultivated Holding		
(1) Gross value of produce	1,275	898
(2) Current farm expenditure	579 (45.4)	368 (41.0)
(3) Farm business income (1-2)	696	530

Figures in brackets are percentages of 2 to 1.

It will be seen from Table XI that the current farm expenditure, both on the per household and per acre of cultivated holding bases was less than half the gross value of produce in both the villages.

Pattern of Current Farm Expenditure on Coconut Cultivation

Item-wise details of current farm expenditure on coconut cultivation given in Table XII reveal that the most important items are purchase of fertilizers and manures and labour charges. Fertilizers and manures together accounted for 72.4 per cent of total expenditure in Kandalur and 49.4 per cent in Eramala. In Kandalur, expenditure on manures amounted to Rs. 358 per acre accounting for nearly three-fifths of the total expenditure. The selected cultivators used *kayal silt* or the mud drawn from the lake and back waters which is considered beneficial to coconut palms, in addition to cow-dung, ashes and green leaves. The cost of adding *kayal silt* is fairly large because of the different operations involved like collection from the lake, transportation through boats, spreading, *etc.*

TABLE XII

CURRENT FARM EXPENDITURE ON COCONUT CULTIVATION — ITEM-WISE DISTRIBUTION

(Rupees per acre)

Item of Expenditure	Kandalur		Eramala	
	Expenditure	Proportion to total	Expenditure	Proportion to total
(1)	(2)	(3)	(4)	(5)
Fertilizers	89	14.4	58	18.2
Manures	358	58.0	99	31.2
Seedlings	24	3.9	13	4.1
Draught power	—	—	15	4.7
Payment to labour*	120	19.4	103	32.4
Repairs to farm implements	6	1.0	3	0.9
Rent	—	—	25	7.9
Land revenue	2	0.3	2	0.6
Pesticides	18	3.0	—	—
Total	617	100.0	318	100.0

* Including payments for harvesting.

Admittedly, the manure cost in Kandalur includes an element of labour charges also, which it was found difficult to isolate. In Eramala, manure cost amounted to Rs. 99 per acre accounting for nearly one-third of the total current farm expenditure. As no *kayal silt* is available the practice is to use cow-dung, ashes, green leaves and farm compost. Fertilizer used was the coconut manure mixture (8N : 8P : 16K) and the expenditure per acre on it amounted to Rs. 89 in Kandalur and Rs. 58 in Eramala. The other major item of expenditure is payment to labour which amounted per acre to Rs. 120 in the former and Rs. 103 in the latter village. The operations involved are : (i) digging the garden and heaping the soil, (ii) digging basins around the tree, (iii) pre-monsoon interculture, (iv) levelling the heaps after monsoon, (v) covering the basins and digging the field after rains, (iv) spreading the manures and (vii) harvesting. In Eramala, the garden is also ploughed with the help of draught cattle twice in a year as in the case of paddy fields. Pesticides are used against diseases like bud rot, leaf rot, *etc.* The expenditure on pesticides worked out to Rs. 18 per acre in Kandalur. In Eramala, however, the trees were free from diseases and hence no expenditure was reported under this item.

Manuring Practices, Time-lag between Application of Fertilizer and Increase in Yields

For the proper maintenance of coconut plantations and for improving yields, manuring has to be done judiciously and regularly. It was pointed out earlier that the cost of manures accounted for a sizeable proportion of the total current farm expenditure. The questions that need examination in this connection are : (a) What is the recommended dose of fertilizer/manure ? (b) What is the time-lag between the application of fertilizer and resultant increase in yield ? and (c) Is it neecssary to apply fertilizers from year to year to increase and to maintain yield? To find answers to these questions data were collected from the selected cultivators, which were supplemented by additional information collected from the Department of Agriculture, the Central Coconut Research Statio nand E.I.D. Parry & Co.

The recommended dose of fertilizer varies from 3 to 4 Kg. per tree and that of manures from 25 to 50 Kg. per tree (Table XIII). Data collected from the selected cultivators brought out that, on an average, chemical fertilizer was applied at the rate of 1.45 Kg. per tree in Kandalur and 1.79 Kg. per tree in Eramala. In respect of manures, it was difficult to estimate the quantities actually put in, but in terms of value the average expenditure per tree worked out to Rs. 3 in Kandalur and Rs. 1.64 in Eramala. The quantity of fertilizer / manures applied varied according to the age of the tree, it being smaller for non-bearing trees and larger for bearing trees. The quantity of fertilizers applied per tree increased steadily from 0.39 kg. in the age-group below 8 years to 2.2 kg. in the age-group between 20-40 years in Kandalur. A similar trend was noticed in the other village also (Table XIV). Application of full dose recommended to trees between 20 and 40 years of age was uncommon.

All agencies have reported that continuous application of fertilizers/manures is necessary for improving the yield and that the increase in yield occurs from the third year of the application of fertilizers/manures. The additional yield per tree received in the third year varies from 5 to 10 nuts and the increase continues upto fifth year according to the Coconut Research Station and upto ninth year according to other three agencies. As shown in Table XIII, the percentage increase in yield from the fourth year shows considerable difference as reported by different agencies. The Indian Central Coconut Committee has reported that

TABLE XIII

RECOMMENDED DOSES OF FERTILIZER/MANURE AND EXPECTED ADDITIONAL YIELD — PER TREE

Reporting Agency	Recommended Doses				Additional Yield—Number of Nuts									
	Chemical Fertilizers		Manures		1st Year	2nd Year	3rd Year	4th Year	5th Year	6th Year	7th Year	8th Year	9th Year	10th Year
	Quantity (Kg.)	Value (Rs.)	Quantity (Kg.)	Value (Rs.)										
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Coconut Research Station (Kasergod)	4	1.80	25	0.20	—	—	10	20 (100%)	30 (50%)	30	30	30	30	30
Director of Agriculture (Trivandrum)	4	1.66	25	0.50	—	—	5	10 (100%)	12 (20%)	15 (25%)	15 —	18 (20%)	20 (11%)	20 —
Dy. Director of Agriculture (Trichur)	3	1.32	50	1.25	—	—	8	10 (25%)	12 (20%)	15 (25%)	20 (33%)	25 (25%)	30 (20%)	30 —
E.I.D. Parry & Co. (Madras)	4.16	1.75	25	0.25	—	—	6	10 (67%)	15 (50%)	20 (33%)	22 (10%)	24 (9%)	25 (4%)	25 —

Figures in bracket refer to percentage increase over the previous year.

"in coconut, the effect of manuring or other agronomic practices on the yield of the trees will be noticed only after a period of about two and a half to three years since this period is required for the development of the nuts from the primordial stage to full maturity".*

TABLE XIV

EXPENDITURE ON FERTILIZERS AND MANURES — PER TREE

Village	Age-group	Chemical Fertilizers		Manures
		Quantity (Kg.)	Value (Rs.)	Value (Rs.)
(1)	(2)	(3)	(4)	(5)
Kandalur	0 - 8	0.39	0.21	0.89
	8 - 10	0.96	0.54	2.19
	10 - 15	1.28	0.70	2.49
	15 - 20	1.34	0.74	3.38
	20 - 40	2.27	1.26	4.02
	40 - 60	1.96	1.10	5.18
	Over 60	1.67	0.94	1.58
	All trees	1.45	0.80	3.07
Eramala	0 - 8	0.74	0.40	1.18
	8 - 10	0.73	0.39	0.86
	10 - 15	0.75	0.41	1.10
	15 - 20	2.00	1.08	1.71
	20 - 40	2.58	1.39	2.00
	40 - 60	1.23	0.67	1.43
	over 60	—	—	—
	All trees	1.79	0.97	1.64

The additional yield obtained during the third year as a result of application of fertilizers/manures showed variations among the different groups of selected cultivators. In Kandalur, the additional yield obtained in the third year varied from 4 to 8 nuts per tree among the different groups of selected cultivators; the average for all the selected cultivators worked out to 5 nuts per tree. In Eramala, on the other hand, the variations in additional yield was from 5 to 9 nuts, the average being 5 nuts per tree. The selected cultivators in both the villages reported that during the first two years after application of fertilizers/manures no additional yield was received. No data on yield after the third year could be collected from the cultivators. However, they reported that the yield would increase every year till the fifth or sixth year and thereafter remain at that high level for 10 years or even more, if proper manuring and cultural practices were followed. An important point to note is that application of fertilizer/manure has to be supported by operations like digging of basins around the tree, interculture, *etc.*, if the benefits are to be fully reaped.

The information collected from the agencies as also from the selected cultivators indicates that application of fertilizers and manures coupled with proper cultural practices should form part of regular cultivation operations every year for increasing the yield as also for sustaining the level of higher yields attained. If it is assumed that under the traditional method of cultivation no fertilizers and pesticides are used, and the expenditure on manures and labour would be about one half of that under improved practices, it follows from the data given in Table XII that the expenditure per acre would be around Rs. 271 in Kandalur and Rs. 159 in Eramala, which works out to Rs. 2.44 and Rs. 2.65 per tree respectively. The additional (non-traditional) current farm expenditure per acre comes to Rs. 346 (Rs. 3.12 per tree) and Rs. 159 (Rs. 2.65 per tree) in the former and latter village, respectively. It was observed that all the selected coconut growers have adopted improved manurial practices to some extent. The question therefore is to increase the input of fertilizers/manures from the existing level to the level recommended. This is discussed in Section IV.

SECTION III

CO-OPERATIVE CREDIT FOR COCONUT CULTIVATION

Types of Loans and Loan Policy

There are two types of loans provided by the co-operative central banks for meeting the current farm expenditure on coconut cultivation. A special type of loan called Coconut Manure Loan is given in kind, by supplying coconut manure mixture to the borrower. Under the Coconut Development Scheme, the State Government supplies chemi-

* Coconut Cultivation, Indian Central Coconut Committee, 1965, Page 18.

cal fertilizers in the form of coconut manure mixture on credit basis to bonafide coconut growers with a view to stepping up coconut production. The scale of finance operative till 1966-67 was at the rate of Re. 1 per tree for two consecutive years. Thus one coconut tree would get coconut manure mixture worth Rs. 2 in two years. The loan has a tenure of two years and the recovery is made in two equal annual instalments. Since 1962-63, these loans have been routed through the co-operative credit organization. Every year the State Government would place the required funds with the State Co-operative Bank which in turn would pass them on to the central co-operative banks. The latter make payments out of this fund to the fertilizer depots from where the required quantum of manure mixture is issued to the cultivators through the primary societies. The ultimate borrower was charged a rate of interest of 7¼ per cent; the margin allowed to the central co-operative banks and the state co-operative bank was 1 per cent each and to the primary credit societies 1¼ per cent. Since 1967-68, the scale has been raised to Rs. 1.75 per tree and the rate of interest to be paid by the ultimate borrower to 8¼ per cent. This rate, it may be noted, is lower than the lending rate of societies for medium-term agricultural loans.

Data on Coconut Manure Loans advanced by the central co-operative banks during the three years ending 1966-67 and the amounts outstanding at the end of these three years are presented in Table XV.

TABLE XV

COCONUT MANURE LOANS BY THE CENTRAL CO-OPERATIVE BANKS — ADVANCES AND OUTSTANDINGS

(Amount in lakh rupees)

District Central Co-operative Bank	Amount advanced			Outstandings at the end of June		
	1964-65	1965-66	1966-67	1965	1966	1967
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1. Alleppey	2.76	2.14	1.86	5.07	4.60	3.73
2. Kozhikode	2.76	1.93	1.45	5.67	4.80	3.77
3. Trivandrum	0.50	0.61	0.12	0.13	1.31	1.04
4. Quilon	1.30	2.21	0.87	4.76	4.79	3.71
5. Kottayam	0.95	1.77	0.20	2.19	1.37	0.83
6. Ernakulam	1.88	0.49	0.82	3.97	2.53	1.60
7. Trichur	5.12	4.17	2.94	9.93	10.40	5.90
8. Palghat	1.90	2.18	2.91	2.71	3.88	2.37
9. Cannanore	3.64	2.78	2.39	5.76	5.37	4.75
Total	20.81	18.28	13.56	40.19	39.05	27.70

The table indicates a declining trend in the total amount advanced reflecting the dwindling popularity of this loan. The total loans advanced by the central co-operative banks in the State declined from Rs. 20.81 lakhs in 1964-65 to Rs. 18.28 lakhs in 1965-66 and further to Rs. 13.56 lakhs in 1966-67. The outstandings have also shown a similar trend falling from Rs. 40.19 lakhs at the end of 1965 to Rs. 27.70 lakhs at the end of 1967. The selected two districts, *viz.*, Alleppey and Kozhikode also noted a similar trend.

Despite the relatively longer period of repayment and a lower rate of interest, the declining trend noticed in the level of advances could be attributed, among others, to the fact that this loan is issued entirely in kind. It was reported also that the co-operatives made no special efforts to popularise this loan as they treated it as an agency function. Moreover, there was no incentive given as the primary societies got a lower margin of 1¼ per cent as against 2¼ per cent in respect of other agricultural loans; besides, they have to put in some extra efforts for arranging transport, supplies and distribution of coconut manure mixture.

The other type of loan issued by the co-operatives for coconut cultivation is the ordi-

nary short-term loan for seasonal agricultural operations. In both the district central co-operative banks data on loans classified according to crops were not readily available. Therefore, short-term loans issued for coconut cultivation were identified from the individual society-wise loan applications. The data thus collected showed that loans issued for coconut cultivation amounted to Rs. 12 lakhs in Kozhikode district and Rs. 16.86 lakhs in Alleppey district accounting for about 7 per cent and 26 per cent respectively of the total short-term loans issued during 1966-67. At the primary society level, during 1966-67, the selected society in Alleppey district advanced Rs. 99,106 for coconut cultivation, accounting for about 86 per cent of its total short-term advances. For the selected society in Kozhikode the respective figures were Rs. 23,700 and 35 per cent.

Borrowings of Selected Cultivators

An analysis of borrowings of the selected cultivators indicates that in Kandalur 15 cultivators borrowed from the village co-operative for coconut cultivation, the average amount per borrowing cultivator being Rs. 447. In Eramala, the respective figures were 8 selected cultivators and Rs. 368.

TABLE XVI

BORROWINGS OF THE SELECTED CULTIVATORS FOR COCONUT CULTIVATION

Item — Villagewise	From Co-operatives				From all agencies including co-operatives
	Short-term loan only	Coconut manure loan only	Short-term & coconut manure loans	Total	
(1)	(2)	(3)	(4)	(5)	(6)
Kandalur					
Number of cultivators borrowing	3	6	6	15	20
Average amount borrowed per borrowing household (Rs.)	505	147	718	447	402*
Proportion of borrowing to current farm expenditure on coconut cultivation	48	14	68	43	38
Eramala					
Number of cultivators borrowing	6	1	1	8	20
Average amount borrowed per borrowing household (Rs.)	423	100	304	368	166*
Proportion of borrowing to current farm expenditure on coconut cultivation	73	17	53	64	29

* Refers to average borrowing per household.

As stated above, the co-operatives provide two types of loans: ordinary short-term loans and coconut manure loans. Data given in Table XVI indicate that in Kandalur out of the 15 cultivators borrowing from the village co-operative, 3 borrowed short-term loan only, 6 coconut manure loans only and the another 6 cultivators both coconut manure and short-term loans. In Eramala, on the other hand, of the 8 borrowing cultivators 6 had borrowed short-term loans only and one cultivator coconut manure loan only. The remaining one borrowed both coconut manure and short-term loans. Borrowings from all agencies averaged Rs. 402 per household in Kandalur and Rs. 166 per household in Eramala, accounting for 38 per cent and 29 per cent of current farm expenditure on coconut cultivation in the former and the latter village, respectively.

Before the introduction of the crop loan system, no specific scale of finance for coconut cultivation was adopted by the co-operatives. Based on the value of security offered and the estimated yield of coconuts, the quantum was fixed within the individual maximum borrowing

limit after taking into consideration the loanable funds available with the society. With the introduction of crop loan system, a separate scale of finance for coconut cultivation has been prescribed. Thus, as shown in Table XVII, during 1967-68 the scale of finance fixed in Alleppey district was Rs. 5 per tree or Rs. 400 per acre and in Kozhikode district Rs. 8 per tree or Rs. 560 per acre. For the year 1968-69, these scales have been revised upwards in both the districts. In the former district, it has been increased by 40 per cent to Rs. 560 per acre or Rs. 7 per tree and in the latter district by 62.5 per cent to Rs. 910 per acre or Rs. 13 per tree.

TABLE XVII

SCALE OF FINANCE FOR SHORT-TERM LOANS FOR COCONUT CULTIVATION

(Amount in rupees)

District		Components			Total
		A	B	C	
			1967-68		
Alleppey	Per acre	240	120	40	400
	Per tree	3	1.50	0.50	5
Kozhikode	Per acre	350	140	70	560
	Per tree	5	2	1	8
			1968-69		
Alleppey	Per acre	320	160	80	560
	Per tree	4	2	1	7
Kozhikode	Per acre	700	140	70	910
	Per tree	10	2	1	13

Note: The average number of trees per acre fixed by the Alleppey and Kozhikode banks is 80 and 70, respectively.

Data collected through our field investigation and analysed in Section II show that the current farm expenditure worked out to Rs. 5.56 per tree in Kandalur and Rs. 5.30 in Eramala. The scales fixed by the central co-operative banks particularly the bank in Kozhikode appear much on the high side when compared with the amounts actually spent by the selected cultivators. The input of fertilizers as reported by the cultivators was below the optimum dosage recommended. As discussed earlier, the fertilizer used by the cultivators in 1966-67 was 1.45 Kg. per tree in Alleppey and 1.79 Kg. per tree in Kozhikode as against 3 to 4 Kg. generally recommended. Even making allowances for the full doses of fertilizers and providing for some additional expenditure on labour charges, *etc.*, the scale appears quite high. Further, in the revised scale for 1968-69 in Kozhikode, the 'A' component which provides for cash advances for meeting the current farm expenditure under traditional method has been doubled from Rs. 350 to Rs. 700 while the 'B' component which provides for kind inputs and which forms the core of the improved technology and the 'C' component have been kept at the previous year's level. It would thus appear that these scales, particularly the 'A' component, were fixed arbitrarily and not on the basis of estimates of prevalent cost of coconut cultivation. Further, the demand for more fertilizers does not get reflected in the provision of 'B' component.

SECTION IV

PERIOD OF LOAN FOR FINANCING CURRENT FARM EXPENDITURE ON COCONUT PALMS

The main points that emerge from the discussion in the previous Sections are: (1) Fertilizers / manures if used for the first time start giving additional yield in the third year; then onwards the yield continues to increase upto

the fifth or sixth year provided the input of fertilizers and manures is continued. (2) For sustaining the higher level of yield reached then onwards, fertilizers / manures have to be applied every year. (3) Almost all coconut growers have been using fertilizers (though not upto the optimum dosage recommended) and as such have already been realising a part of the additional yield expected. (4) The total current farm expenditure on coconut cultivation worked out to Rs. 617 per acre and Rs. 318 per acre in Kandalur and Eramala and formed 47.5 per cent and 35.1 per cent of gross value of produce, respectively. On a palm basis, it amounted to Rs. 5.56 in the former and Rs. 5.30 in the latter village. (5) The primary co-operative societies provide short term loans for coconut cultivation and also coconut manure loans in kind under the Government Scheme. (6) A separate scale of finance for coconut cultivation has been fixed by both the central co-operative banks since 1967-68. (7) In 1968-69 the scales fixed per tree worked out to Rs. 7 in Alleppey and Rs. 13 in Kozhikode.

It has been stated earlier that fertilizers and manures have to be applied every year if the level of yield has to be further raised and sustained till the palms reach old age. Thus, the adoption of higher technology, which involves larger input of fertilizers will in the long run raise the level of current farm expenditure to be incurred annually as compared with that under the traditional cultivation. This will require larger short-term production credit, as in case of other crops in respect of which improved practiees and modern technology have been adopted, till the additional income generated raises the quantum of savings which will be ploughed back in farm business. It has been observed that if the fertilizers are applied for the first time, the higher yield starts realising in the third year. From the data collected it may be noted that the coconut plantations comprise of palms of different age-groups. Further, the cultivators have been using fertilizers and manures, though not upto the dosages recommended. Raising the input upto the recommended level is merely accelerating the process which has already been started and thereafter maintaining the level reached, becomes a part of annual seasonal agricultural operations. As the use of fertilizers and manures has already been in vogue, its benefit can be presumed to have started reaping. This would be augmented with the increased use of fertilizers. The question, therefore, is one of fixing the scale of finance for current cost of cultivation in the light of the requirements of the improved technology. Another important feature discussed earlier is that it is very rare to find a cultivator growing coconuts only on his holding. Generally, the coconut grower allocates a part of his holding for paddy cultivation, a part for coconut plantation and on the rest he grows one or more of the crops like coconut, arecanut, tapioca, plantain, *etc.* His farm business has to be considered as a whole and not in terms of fields or crops separately. Thus his total credit needs will be in relation to the various crops grown and the drawals on these limits will be according to the different seasonal agricultural operations. As stated earlier, because of a number of crops grown, some of which are harvested more than once in a year, the cash receipts from sales are obtained almost throughout the year. These facts have to borne in mind in the determination of credit limits and the repayment schedule. Perhaps some kind of cash credit arrangements appear more advisable than granting of special loans for the use of an input for a specified duration. In order to ensure that the credit is utilised for the use of fertilizers and other inputs, necessary safeguards will have to be provided.