

REPORT
ON
THE NUTRITIONAL DIET SURVEY
OF WORKERS IN TEA
PLANTATIONS

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REPORT ON THE NUTRITIONAL DIET SURVEY OF TEA PLANTATION LABOURERS IN KERALA STATE

SECTION I

Introduction

1.1. The working class cost of living index numbers are being computed by the Department of Statistics and are published regularly in the Government Gazette. These indices are being computed on the basis of consumption pattern in average households. The Ministry of Commerce and Consumer Industries of Government of India in their letter No. 5 (14) Plant (Cell) 56, dated 18th December 1956, to the Chief Secretary to Government of Kerala enquired whether factors like family budgets, nutritional diet, number of units in the family, prices of food articles, proportion of wages to men, women and adolescents, etc., are taken into account in the computation of these indices. As the indices which are published by the Department does not take into account all these factors, Government of Kerala, in their Order L1-30443/57/L and LAD, dated 5th February 1958, asked the Director of Statistics to conduct a nutritional diet survey in respect of plantation labour in the tea industry. Accordingly a survey was carried out by this Department.

1.2. The information collected related to the various aspects of their lives, namely:—

(a) demographic and occupational particulars, such as, age, sex and marital status of household members, their education standard, economic status, and employment status,

(b) earnings of working members of the households,

(c) expenditure of households by various items of consumption, the quantities of commodities utilised for consumption every day for a period of 10 days,

(d) number and value of loans taken and details of their utilisation, and

(e) housing and sanitation.

Sampling design and field work

1.3. Sampling was done in two stages, estates forming the first stage units and the households the final stage units. Altogether 19 tea estates were selected at random, scattered over the five districts of Trivandrum, Quilon, Kottayam, Trichur and Palghat. From each of the selected estate a sample of ten workers' households was selected by systematic sampling method for detailed enumeration.

1.4. The field work relating to the survey commenced on 6th March 1958 and was completed on 21st March 1958. The data were collected by interview method. Two Investigators were allotted to each of the estate. In order to study the nutritional aspect of consumption the quantities of food items consumed and the expenditure thereof were collected for a period of 10 consecutive days. The Investigators had to stay in the estate for these ten

days and they visited each household twice a day in the morning and in the evening. The various commodities that were consumed were actually weighed by the Investigators before preparing the meals and their prices were ascertained and the respective schedules were filled in. The work of the Investigators were supervised by the taluk Statistical Inspectors and the District Statistical Officers.

1.5. The analysis of the data collected was done in the Office of the Director of Statistics. The results are discussed in the following pages.

General habits of workers

1.6. The study was confined only to 190 households of Estate Workers. This comes to slightly greater than 4 per cent of the total number of house-holds. In every household both the grown-up male and female go out for work. The working hours is normally from 7 a.m. to 5 p.m. with an interval of one hour in the afternoon for mid-day meals. Hence they are early risers by habit and get up by about four in the morning. Since the male and female members have to go out for work, both breakfast and mid-day meals will be prepared in the morning itself. Thus these households cook their meals twice a day, the second being in the evening after returning from the day's work. Eventhough almost all of them are non-vegetarians, they usually purchase fish, meat, etc., only on holidays. Most of the other days they use vegetables.

1.7. Most of the workers are Tamilians who have migrated into the plantation area. The distribution of households on the basis of religion is 80 per cent Hindus, 18.4 per cent Christians and 1.6 per cent Muslims. The workers live in quarters provided by the estate owners. These are found to be over-crowded and unhealthy. It is not rare to see that one or two families are accommodated in a single room and neither the workers nor the estate owners care to keep the places neat and clean. Thus in regard to housing conditions, they are far below the general standard.

1.8. Considering their educational standard the estate workers, perhaps from the most backward group, but as regards literacy, they are not far below the general population. In each Estate a school is being run by the estate owners, but the workers are not keen on making full use of this amenity.

1.9. The workers do not, in general, get ample medical aid though in each estate there is a dispensary and one compounder. The workers do not care to utilise what little facilities are made available to them.

The tables

1.10. The main tables are attached at the end of this report as Appendix. The tables given are—

Appendix I—The list of selected estates.

Appendix II—(1) The average household size.

(2) Distribution of persons according to age, sex and economic status.

(3) Number of persons worked, days at work and income.

(4) Average monthly expenditure per household.

(5) Average expenditure on food per household.

- (6) Distribution of loans and their purpose.
- (7) Average consumption per adult per day and its constituents.
- (8) Constituents of certain items of food.
- (9) Compositions of an actual diet of an adult worker, an improved diet and balanced diet.

1.11. In addition summary tables have been given in the following pages where the more important results of the survey have been discussed in detail.

SECTION II

Household size

2.1. Appendix II, Table I, presents the average household size for the selected households in the different estates and the sex ratio. Taking all the estates together the average size of an estate worker's household is found to be 4.9 which is much less than the average household size for the general population of Travancore-Cochin in the income group less than Rs. 200, which is 6.3. The average adult equivalent of an estate worker's household works out to 3.72 and the average sex-ratio is 1038. The sex-ratio 1,038 means that for every 1,000 males there are 1,038 females among the estate workers. The corresponding figure for the General Population is 1,028 according to 1951 Census.

Age distribution

2.2. The percentage distribution of the members of the sample households by age group and sex is given in the following table:

TABLE (2.1)

Percentage distribution of members of Tea Plantation workers' households by age and sex

Age group	Males	Females	Total
1	2	3	4
0-4	8.0	10.4	18.4
5-14	14.0	12.1	26.1
15-24	7.0	11.0	18.0
25-44	14.9	12.9	27.8
45-64	4.4	4.3	8.7
65 and above	0.8	0.2	1.0
Total ..	49.1	50.9	100.0

Literacy

2.3. The following table gives of the percentage distribution of the members in the sample households according to age and literacy.

TABLE (2·2)
Percentage distribution of members of the sample households
according to age and literacy

Educational status	Age group						Total
	0-4	5-14	15-24	25-44	45-64	65 and above	
1	2	3	4	5	6	7	8
Illiterate ..	18·3	10·8	10·9	15·0	6·6	0·8	62·4
Below Primary ..	0·1	14·4	5·4	9·1	1·6	0·1	30·7
Primary ..	..	0·7	1·0	2·9	0·4	..	5·0
Middle ..	..	0·2	0·7	0·8	0·1	0·1	1·9
Matriculation ..	..	..	..	..	..	..	..
Total .	18·4	26·1	18·0	27·8	8·7	1·0	100·0

2.4. The above table clearly indicates the poor Educational Standard of the estate workers and the members of their households. About 62 per cent of the population is illiterate. This is slightly more than the percentage of illiterates in the general population of Kerala which is 59·6 according to 1951 Census. Less than 31 per cent have reached below the primary standard. Only 7 per cent have gone above the primary level but none have passed the matriculation standard. Taking the school-going age, i.e., 5 to 14 nearly 41 per cent are illiterate, while in the age groups 15 to 24 and for persons of age 25 and above the percentages of illiterates are 61 and 60 respectively. Thus it is seen that there is a change in favour of education at present compared to previous times.

Civil conditions

2.5. The following table gives the percentage distribution of the population according to marital status in the different age groups.

TABLE (2·3)
Percentage distribution of the population according
to marital status

Marital Status	Age group						Total
	0-4	5-14	15-24	25-44	45-64	65 and above	
1	2	3	4	5	6	7	8
Unmarried ..	18·4	26·1	8·7	1·3	..	..	54·5
Married	8·6	24·4	5·6	0·3	38·9
Widowed	0·2	1·3	2·9	0·7	5·1
Divorced	0·4	0·5	..	..	0·9
Separated	0·1	0·3	0·2	..	0·6

2.6. Taking the population as a whole only 18 per cent of the population of age 15 and above are unmarried while 70 per cent are married. 9 per cent of the persons are widowed and the percentage of persons in the categories divorced and separated is about 3.

Economic status

2.7. The following table gives the distribution of persons according to age and economic status. The figures are expressed as percentages.

TABLE (2.4)

Percentage distribution of persons according to age and economic status'

Economic Status	Age group						Total
	0-4	5-14	15-24	25-44	45-64	65 and above	
1	2	3	4	5	6	7	8
Earners ..	..	0.1	11.5	24.8	5.5	0.1	42.0
Earning dependants ..	..	0.6	3.3	1.9	0.5	..	6.3
Non-earning dependants ..	18.4	25.4	3.2	1.1	2.7	0.9	51.7
Total ..	18.4	26.1	18.0	27.8	8.7	1.0	100.0

2.8. Taking all the age groups together, it is seen that 42 per cent of the persons are earners, 6.3 per cent earning dependants and 51.7 per cent non-earning dependants. From Table II—Appendix II it can be seen that taking the earners and earning dependants together, the economically active people are distributed evenly between males and females. Of the total number of non-earning dependants, 86 per cent are accounted for by persons of age below 15 and over 65. Thus only 14 per cent of the non-earning dependants are in the age group 15 to 64. They form about 7 per cent of the population.

Occupation

2.9. The main items of work of the labourers enumerated are plucking, weeding and other field work, factory labour and other unspecified jobs. These have been studied under primary occupation and secondary occupation. The primary occupation has been defined as the one from which the major portion of the income is derived while others are defined as secondary.

2.10. The subjoined table gives the percentages distribution of the working population according to occupation separately for one month and one year immediately preceding the date of survey.

TABLE (2.5)

The percentage distribution of working population according to Primary and Secondary occupation

Secondary occupation	Primary occupation									
	Month					Year				
	Plucking	Field work	Factory Labour	Others	Total	Plucking	Field work	Factory Labour	Others	Total
1	2	3	4	5	6	7	8	9	10	11
Plucking ..	..	0.4	..	..	0.4	..	0.2	..	..	0.2
Field work ..	..	..	..	..	..	0.2	1.8	..	0.2	2.2
Factory labour ..	..	..	..	..	..	..	..	..	..	..
Others ..	4.5	2.4	0.2	3.1	10.2	4.7	2.5	0.2	2.2	9.6
Nil ..	48.2	23.4	5.9	11.9	89.4	47.8	22.9	5.8	11.5	88.0
Total ..	52.7	26.2	6.1	15.0	100.0	52.7	27.4	6.0	13.9	100.0

2.11. The table indicates that there is not much difference in regard to occupation pattern for the month and for the year as should generally be expected in the case of estate workers. 89 per cent of the workers do not have any secondary occupation. Considering the primary occupation alone, slightly less than 53 per cent of the workers are engaged in plucking, 26 per cent in field work, 6 per cent in factory labour and the remaining 15 per cent in other items of work.

Days of work and income

2.12. The following table gives the number of workers, the average number of days worked and the average daily earnings for one month and one year separately for the primary and secondary occupation as obtained from the sample.

TABLE (2.6)

Table showing the number of persons worked, the average number of days at work and the average earning for a month and for a year

Item of work	Primary			Secondary			
	Number of persons worked	Average number of days at work	Average earnings per day Rs.	Number of persons worked	Average number of days at work	Average earnings per day Rs.	
1	2	3	4	5	6	7	
Month	Plucking ..	236	19.68	1.49	2	8.50	1.94
	Field work ..	117	13.87	2.16	..	..	..
	Factory labour ..	27	25.81	1.87	..	..	..
	Others ..	66	27.55	1.51	46	5.30	2.21
	Total ..	446	19.69	1.61	48	5.43	2.19
Year	Plucking ..	236	234.69	1.50	1	122.00	1.54
	Field work ..	122	171.81	2.05	10	51.10	1.24
	Factory labour ..	27	249.81	2.17	..	..	..
	Others ..	61	347.06	1.33	43	69.37	2.26
	Total ..	446	233.77	1.91	54	66.96	2.09

2.13. From the tables it is seen that the distribution of workers is more or less the same for the month and for the year based on the items of work and classification under primary and secondary occupation. The variation between the average daily income for the month and the year in the case of field work and factory labour may be due to the fact that there are different operations in these sectors which are differently paid. On an average a labourer gets work for 20 days in a month and 233 days in a year.

Expenditure

2.14. From the sample households, data relating to family budget also have been collected. The expenditure is divided into five broad groups, *viz.*, food, fuel and lighting, housing, clothing and miscellaneous. The following table gives the distribution of expenditure under the above five heads for the sample households.

TABLE (2.7)

Table showing the expenditure per household, per capita and per adult equivalent for the sample households for a month

Items of expenditure	Per household Rs.	Per capita Rs.	Per adult equivalent Rs.
1	2	3	4
Food ..	95.52	19.66	25.71
Fuel and lighting ..	7.53	1.55	2.03
Housing ..	1.77	0.36	0.48
Clothing ..	14.30	2.94	3.85
Miscellaneous ..	20.09	4.15	5.40
Total ...	139.21	28.66	37.47

2.15. The average monthly expenditure of a household is found to be Rs. 139.21 and this is 171 per cent of the average income which comes to only Rs. 81.34. The per capita expenditure works out to be Rs. 28.66.

2.16. Table IV—Appendix II presents the distribution of the average monthly expenditure per household among the five groups with the corresponding percentage to the total expenditure. The worker's household spends on an average about 69 per cent of the total expenditure on food items, 10 per cent on clothing, 5 per cent on fuel and lighting, 1 per cent on housing and 14 per cent on miscellaneous items. The 1 per cent of expenditure under housing includes purchase of utensils, furniture, etc. It has to be noted that the workers are given free quarters and hence they do not have any expenditure under rent. The percentage of expenditure on food is slightly greater,

than the corresponding percentage for the families in the income group less than Rs. 200 for the general population in the different centres in Kerala as obtained from the family budget surveys. The subjoined table gives the expenditure pattern of households earning less than Rs. 200 a month for the various centres in the State collected through earlier surveys. In this table the expenditure on fuel and lighting is included in the expenditure under housing.

TABLE (2.8)

Table showing the pattern of percentage expenditure on food, housing, clothing and miscellaneous for centres in Travancore-Cochin and Malabar area

Centre	Food	Housing	Clothing	Miscellaneous	Total
1	2	3	4	5	6
Trivandrum	61.28	18.45	6.93	13.34	100.00
Quilon	67.23	11.66	6.46	14.65	100.00
Allappay	57.69	16.64	5.09	20.58	100.00
Kottayam	63.71	14.46	5.92	15.91	100.00
Munnar	59.73	11.00	11.11	18.16	100.00
Trichur	65.04	21.09	4.72	9.15	100.00
Palghat	56.27	16.25	12.28	15.20	100.00
Shornur	57.02	17.32	10.98	14.68	100.00
Ponnani	59.18	18.30	10.43	12.09	100.00
Kozhicode	56.31	15.43	13.21	15.05	100.00
Tellicherry	55.34	19.09	11.37	14.20	100.00
Cannanore	55.44	15.32	12.25	16.99	100.00
Kasaragod	58.28	17.88	10.50	13.34	100.00

2.17 14 per cent of the total expenditure of the tea plantation workers' household spent on miscellaneous items, includes the expenditure for toilets, services, pan, beedi and cigarettes, intoxicants, ceremonies, education, medical care, etc. Pan accounts for 2.6 per cent of the total expenditure while 1.8 per cent is spent for beedi and cigarettes. The percentage of expenditure on drinks is 2 per cent while the expenditure on education comes to about 0.4 per cent.

2.18. An attempt has also been made to calculate the elasticities of expenditure for food and clothing with respect to the total expenditure and average family size. The relation between the factors was assumed to be of

the form : $y = Cx^a z^b$, where y is the expenditure for a particular group, x the total expenditure and z the average family size, a , b and c being constants.

Taking logarithms.

$$\log y = \log c + a \log x + b \log z.$$

In general for the j th group

$$\log y_j = c_j + a_j \log x_j + b_j \log z_j.$$

Using the average monthly expenditure for the 19 estates, the constants c^1 ; a and b have been evaluated by the method of least squares. Here since there is much difference in the household composition, the average household size is replaced by the average adult equivalent. The following are the values of a and b :

		a	b
Food	..	1.0079	-0.0124
Clothing	..	0.8953	-0.3775

The coefficients a and b are defined as the partial elasticities of expenditure for the group with respect to total expenditure, and average family size respectively.

The elasticity of expenditure on food with respect to the total expenditure is 1.0079. This is not in conformity with Engel's law, which states that, as the total expenditure increases the proportion expended on necessities decreases and hence coefficients of elasticity will be less than one. This may be due to the fact the income in the case of the estate workers is insufficient to meet the expenditure even on necessities. This is the case with clothing also, the elasticity for which is 0.8953, *i.e.*, less than one.

2.19. The coefficient of elasticity with respect to average size are found to be negative for both food and clothing. This is because b represents a combination of two effects. First one is specific effect, *i.e.*, a result of the increase in need for the various commodities when the family size is increased, while the second is the income effect, which means that an increase in family size makes the people relatively poorer. The coefficient b does not separate these two effects. Hence b will be positive or negative according as the first effect is stronger or otherwise. Here in this case the income effect being stronger the coefficient is negative.

Loans

2.20. Of the 190 households enumerated, 128 households had outstanding loans against them and the total number of loans is found to be 247. Thus nearly only 33 per cent of the households are free of loans.

The following table gives the distribution of households according to the number of outstanding loans against them.

TABLE (2.9)

Table showing the distribution of households according to the number of outstanding loans against them

No. of loans outstanding	Households	
	No.	Percentage
(1)	(2)	(3)
0	62	32.7
1	66	34.8
2	28	14.7
3	16	8.4
4	13	6.8
5	5	2.6
Total	190	100

2.21. The number of loans outstanding against a household varies from 1 to 5. The total amount indebted by these households is Rs. 30,918. The average value of a loan comes to Rs. 242. Considering all the 190 households the average value of loan per household is Rs. 163.

2.22. The distribution of loans, according to the purpose for which the loans were taken is presented in Table VI—Appendix II in detail. The following table gives the number, the amount and their percentage to the total of the loans classified by the purpose for which the loans were taken.

TABLE (2.10)

Table showing the purpose of the number, the amount and the average value of loans taken by the households

Purpose	Loan		Amount		Average value per loan Rs.
	No.	Percentage to the total	No.	Percentage to the total	
1	2	3	4	5	6
Consumption Expenditure ..	163	66	17,220	55.7	106
Capital expenditure ..	13	5	2,672	8.6	206
Education ...	4	2	265	0.9	66
Medical ..	20	8	2,095	6.8	105
Ceremonial ..	15	6	5,640	18.2	376
To repay outstanding loans ..	8	3	426	1.4	53
Others ..	24	10	2,600	8.4	108
Total ..	247	100	30,918	100	125

2.23. 66 percent of the loans covering nearly 56 per cent of the total amount was taken for consumption expenditure. The average value of such loans is Rs. 106. The loans taken for ceremonials cover 18 per cent of the amount and the average amount per loan is Rs. 376. About 5 per cent of the loans covering nearly 8.6 per cent of the amount is taken for expenditure of a capital nature and the average value of loans in this category is Rs. 206. Loans for educational purposes occupies the last place both in number, total amount and average amount per loan.

Assets and Liabilities

2.24. Details regarding the assets and liabilities of the sample households are furnished below.

Assets

	Rs.	Percentage to the total
1. Loans given	2,000	1.9
2. Deposits	2,681	2.5
3. Chitties or Kuries	5,362	5.0
4. Ornaments	13,768	12.8
5. Land	50,431	46.9
6. Buildings	9,165	8.5
7. Livestock	8,306	7.7
8. Implements	4,608	4.3
9. Others	11,252	10.4
10. Total assets	1,07,573	100.0

Liabilities

1. Loans taken	20,528	45.8
2. Interest payable	1,883	4.2
3. Land mortgaged	3,020	6.3
4. Chitties or Kuries	2,841	6.4
5. Others	16,517	36.9
6. Total liabilities	44,789	100.0

2.25. Taking all the household together, it is seen that nearly 46.9 per cent of the total assets is in the form of land and 12.8 per cent of the assets is in the form of gold. Buildings account for 8.5 per cent of the assets, livestock 7.7 per cent, implements 4.2 per cent, deposits and chitties 7.5 per cent, loans given 1.9 per cent and other items of assets 10.4 per cent. The fact that nearly $\frac{1}{3}$ of the total assets is ornaments indicates that the estate workers have a preference for ornaments. The workers do not save much in cash as only 2.5 per cent of the total assets come under deposits.

2.26. On the liabilities side, nearly 45.8 per cent is accounted for by loans which have to be repaid, while the interest payable on loan comes to about 4.2 per cent. Taking land mortgaged also as loans with security, loans taken together with interest payable account for 56.7 per cent of the total liabilities. Remittances due to chitties account for 6.4 per cent of the liabilities and others 16.9 per cent.

Nutritional Diet

2.27. The Investigators have kept each of the selected household under observation for a period of 10 days. On these days they visited the households twice every day and collected the information relating to the quantities and value of all the food items actually consumed by the members of the households. The Investigators were supplied with balances to find the weight of the commodities consumed every day on these 10 days.

2.28. The quantities of the various food items consumed per day by one adult worker, are tabulated in column 3 of Table VII—Appendix II. The columns 4, 5, 6 and 7 of Table VII give the net calories, protein, calcium and iron intake per person per day. This has been calculated using the figures in Table VIII—Appendix II which are obtained from Public Health Laboratory, Trivandrum.

2.29. The daily requirements of calories, protein, calcium and iron for an adult male and female of the working group, and the actual quantities of the same available for an adult worker in tea plantations are detailed below.

TABLE (2.11)

Table showing the daily requirements of calories, protein, calcium and iron for adult male and female workers and the quantities available per worker

	Net Calories	Protein	Calcium (Grams)	Iron (M.m.)
1	2	3	4	5
Required for a hard working adult:-				
Male ..	3,600	82	1.0	20 to 30
Female ..	3,000	67	1.0	20 to 30
Available for an adult worker ..	2,900	68	0.5	28

2.30. In the calculation of the total quantity of intake of nutrients by the adult workers, the contribution from the food consumed from hotels and restaurants and from eggs and certain fruits have not been taken into account since the weight of such items actually consumed could not be estimated.

2.31. The net calories required for an adult worker is taken as the weighted arithmetic mean of the requirements of the male and female workers, the weights being the number of males and females in the sample. Calculation of an average became necessary because of the fact that quantities consumed by males and females were not available separately. Only the average consumption by a member of the sample could be obtained. The calorie requirement of an adult worker in plantations thus worked out comes to 3,294, and that consumed at present is 2,900. Thus there is a difference of 394 calories, which is about 12 per cent of the requirement. Coming to proteins, the weighted mean is 74 grm., thereby indicating a deficiency of nearly 9.5 per cent. In regard to calcium the percentage deficiency is very high and an adult worker gets only half the requirements. There is no deficiency as regards the quantity of iron in the food consumed by the workers.

2.32. The composition of the actual diet consumed by an adult worker can be compared with that of an improved diet and a balanced diet using the figures given in Table IX—Appendix II. The composition of these three types are given in columns 2, 4 and 6 respectively. The value of each of the item actually consumed by an adult worker is furnished in column 3 while the approximate cost of the constituents of an improved diet and the balanced diet valued at the same rate are given in columns 5 and 7, respectively.

2.33. From the table it can be seen that the quantities of the various items consumed by an adult worker are less than the requirements of the improved diet and the balanced diet except in the case of cereals. The normal requirement of cereals is only 14 ozs. while an adult worker consumes nearly one and a half times this quantity. Rice constitutes 98 per cent of the cereals consumed.

2.34. The following table gives the percentage variation of the various food items actually consumed from the requirements according to an improved diet and a balanced diet.

TABLE (2.12)

Percentage variation of various food items consumed from the requirements of the improved and balanced diets

Items	Actually consumed (oz.)	Constituents improved diet	Percentage variation	Constituents of balanced diet (oz.)	Percentage variation
1	2	3	4	5	6
Cereals ..	21.47	14	+ 53	14	+ 53
Pulses ..	2.20	3	- 17	3	- 17
Vegetables ..	4.07	14	- 71	10	- 59
Oils and fats ..	0.68	2	- 66	2	- 66
Milk ..	3.27	4	- 18	10	- 67
Sugar and Jaggery ..	1.90	2	- 5	2	- 5
Meat and fish ..	1.78	..	..	3	- 41

2.35. Considering the amount expended the food consumed by an adult worker costs 88 nP. per day. Valued at the same prices, the cost of an improved diet and a balanced diet cost 72 nP. and 96 nP. The amount of 21 nP. given against other items in column (3) of Table IX—Appendix II, includes the amount expended on fruits, spices and condiments which are not included either in the improved diet or in the balanced diet. Excluding this 21 nP. the cost of an estate worker's diet comes to only 93 per cent of the cost of an improved diet and 70 per cent of the cost of a balanced diet.

Conclusions

2.36. The workers in tea plantation form a group differing from the general population of Kerala. The average size of a worker's household is smaller when compared with the general population. The per capita expenditure of a worker is found to be Rs. 28.66 per month, while the income is only less than 60 per cent of the expenditure. This gap is filled in by taking

loans, which is clear from the fact that 67 per cent of the households are indebted and that a major percentage of the loans taken comes under the purpose consumption expenditure. Another feature noted is that the proportionate expenditure on food is remarkably greater and yet the food they consume is not nutritious enough. Also the cost of the food items consumed by an adult worker in one day is less than the cost of a balanced diet by only 8 nP. and is greater than that for an improved diet by 16 nP. But it is seen that nearly one-fourth of the cost of the actual diet is spent in other items like spices and condiments, beverages, fruits, food from hotels, etc. They can make up the deficiency of nutrients if this amount or a part of it is utilised on items like milk, oils, and fats, etc. Above all, the quantity of rice consumed by an adult worker is more than what is actually needed.

2.37. But the coefficient of elasticity of expenditure on food with respect to total expenditure is found to be greater than one, thereby indicating that an increase in the total expenditure will not bring any decrease in the proportion expended on food. It can therefore, be concluded that the workers, in general have not reached a level of satisfaction in regard to food, in the sense that any additional income they get, will be utilised to purchase more food items. Naturally, there will not be a proportionate increase in the amount expended in the other groups, or in otherwards the proportionate expenditure in the other groups will show a decrease. This is further confirmed by the co-efficient of elasticity in clothing with respect to total expenditure which works out to be less than one. Such a type of expenditure pattern, is nothing uncommon in a society of workers as this, in which both man and woman have to do hard manual labour for not less than eight hours a day.

APPENDIX I

List of Selected Estates

<i>Sl. No.</i>	<i>Name of Estate</i>	<i>District in which it is situated</i>
1.	Ponmudi ..	Trivandrum
2.	Bonnocode ..	"
3.	St. Mary's ..	Quilon
4.	Isfield ..	"
5.	Carmel ..	"
6.	Ambanad ..	"
7.	Pasupara ..	Kottayam
8.	Tyhrd Vembanad and Fairfield..	"
9.	Shoolamalai ..	"
10.	Devicolam ..	"
11.	Panniar ..	"
12.	Elappally ..	"
13.	Kannimala ..	"
14.	Wallardy ..	"
15.	Pasumala ..	"
16.	Munnar ..	"
17.	Malakappara ..	Trichur
18.	Siruvani ..	Palghat
19.	Varadimala ..	"

APPENDIX II
Table I—Average Household Size

Serial No.	Name of Estate	Sample population			Average H. H. Size	Adult equivalent	Sex ratio
		Persons	Males	Females			
1	2	3	4	5	6	7	8
1	Ponmudi	59	32	27	5.9	4.58	844
2	Bonnocode	47	27	20	4.7	3.54	741
3	Isfield	54	22	32	5.4	4.08	1455
4	St. Marys	59	31	28	5.9	4.42	903
5	Carmel	48	25	23	4.8	3.68	920
6	Ambanad	43	23	20	4.3	3.32	870
7	Kannimala	44	20	24	4.4	3.30	1200
8	Devicolum	54	28	26	5.4	4.12	929
9	Munnar	47	24	23	4.7	3.72	958
10	Choolamala	41	22	19	4.1	3.36	864
11	Fairfield	42	17	25	4.2	3.40	1471
12	Pasuparai	41	21	20	4.1	3.10	952
13	Wallardy	47	25	22	4.7	3.58	880
14	Pasumala	53	23	30	5.3	4.00	1304
15	Panniyar	42	19	23	4.2	3.22	1211
16	Elappally	43	19	24	4.3	3.32	1263
17	Malakkappara	60	29	31	6.0	4.56	1069
18	Varadimala	39	18	21	3.9	3.00	1167
19	Siruvani	60	28	32	6.0	4.32	1143
	All Estates	923	453	470	4.9	3.72	1038

Table II—Percentage distribution of persons according to Age, Sex and Economic status

	All			Below 5			5—14			15—24		
	T	M	F	T	M	F	T	M	F	T	M	F
I	2			3			4			5		
Earners ..	42.0	22.5	19.5	..	..	..	0.1	..	0.1	11.5	4.4	7.1
Earning dependants ..	6.3	1.8	4.5	..	..	..	0.6	0.3	0.3	3.3	1.1	2.2
Non-earning dependants ..	51.7	24.8	26.9	18.4	8.0	10.4	25.4	13.7	11.7	3.2	1.5	1.7
Total ..	100.0	49.1	50.9	18.4	8.0	10.4	26.1	14.0	12.1	18.0	7.0	11.0

	25—44			45—64			65 and over		
	T	M	F	T	M	F	T	M	F
	6			7			8		
Earners ..	24.8	14.1	10.7	5.5	3.9	1.6	0.1	0.1	..
Earning dependants ..	1.9	0.4	1.5	0.5	..	0.5	..	..	..
Non-earning dependants ..	1.1	0.4	0.7	2.7	0.5	2.2	0.9	0.7	0.2
Total ..	27.8	11.9	12.9	8.7	4.4	4.3	1.0	0.8	0.2

Table III--Number of persons worked days at work and income for one month and one year according to occupations

Item of work	Primary			Secondary			Others			
	Persons worked	Days at work	Income Rs.	Persons	Days	Income Rs.	Persons	Days	Income Rs.	
1	2			3			4			
Month	Plucking	236	4,644	6,941	2	17	33	..	..	..
	Field work	117	1,623	3,504	..	..	..	..	..	..
	Factory labour	27	697	1,302	..	..	..	..	..	..
	Others	66	1,818	2,373	46	244	539	..	..	766
	Total	446	8,782	14,120	48	261	572	..	..	766
Year	Plucking	236	55,386	83,219	1	122	488	..	..	..
	Field work	122	20,961	43,036	10	511	632	..	..	..
	Factory labour	27	6,745	14,643	..	..	..	..	..	..
	Others	61	21,171	28,254	43	2,983	6,741	..	..	13,241
	Total	446	104,263	1,69,152	54	3,616	7,561	..	..	13,241

Table IV—Average monthly expenditure per household

Name of estate	All groups		Food		Fuel and lighting		Housing		Clothing		Miscellaneous	
	Amount Rs. nP	Amount Rs. nP	Per- centage total ex- penditure	Amount Rs. nP	Per- centage total ex- penditure	Amount Rs. nP	Per- centage total ex- penditure	Amount Rs. nP	Per- centage total ex- penditure	Amount Rs. nP	Per- centage total ex- penditure	
1	2	3	4	5	6	7	8	9	10	11	12	
Ponmudi ..	137 78	99 61	72.30	8 13	5.90	0 95	0.69	13 44	9.75	15 65	11.36	
Bonocoda ..	126 21	90 36	71.59	7 08	5.61	2 59	2.05	13 89	11.01	12 29	9.74	
Isfield ..	119 76	82 98	69.21	8 37	6.99	2 09	1.75	10 05	8.38	16 28	13.59	
St. Marys ..	109 10	72 65	66.59	10 73	9.84	1 44	1.32	9 14	8.38	15 14	13.87	
Carmel ..	70 01	45 40	64.85	5 46	7.80	1 55	2.21	8 95	12.78	8 65	12.36	
Ambanad ..	98 44	68 09	69.17	5 06	5.14	4 51	4.58	11 75	11.94	9 03	9.17	
Kannimalai ..	201 96	142 73	70.67	9 97	4.94	0 58	0.29	19 89	9.85	28 79	14.25	
Devicolum ..	188 54	138 55	73.49	8 89	4.72	0 80	0.42	17 93	9.51	22 37	11.86	
Munnar ..	117 09	78 84	67.33	7 55	6.45	3 27	2.79	12 89	11.01	14 54	12.42	
Choolamalai ..	156 93	99 85	63.63	10 12	6.45	1 98	1.26	21 33	13.59	23 65	15.07	
Fairfield ..	228 57	159 54	69.80	8 68	3.80	2 69	1.18	19 72	8.62	37 94	16.60	
Pasupara ..	129 68	82 34	63.49	7 49	5.78	1 71	1.32	20 84	16.07	17 30	13.34	
Wallady ..	191 52	119 81	62.56	10 06	5.25	3 35	1.75	19 28	10.07	39 02	20.37	
Pasumalai ..	149 55	101 39	67.80	5 38	3.60	1 35	0.90	14 03	9.38	27 40	18.32	
Panniyar ..	156 82	99 31	63.33	11 80	7.52	1 28	0.82	20 17	12.86	24 26	15.47	
Elappally ..	104 73	74 99	71.60	8 40	8.02	1 51	1.44	8 48	8.10	11 35	10.84	
Malakappara ..	116 80	76 29	65.32	5 68	4.86	1 12	0.96	11 96	10.25	21 74	18.61	
Varadimala ..	125 68	100 74	80.16	1 69	1.34	0 42	0.33	7 86	6.25	14 97	11.92	
Siruvany ..	115 96	81 30	70.11	2 49	2.15	0 52	0.45	10 16	8.76	22 49	18.53	
All Estates ..	139 22	95 52	68.61	7 53	5.41	1 77	1.27	14 30	10.27	20 10	14.44	

Table V—Average expenditure on food per household

Serial No.	Estate	For 10 days	For a month Rs.	Percentage of monthly expenditure to that of 10 days
1	2	3	4	5
1	Ponmudi	39·02	99·61	255
2	Bonoccord	32·81	90·36	275
3	St. Marys	24·44	72·65	297
4	Isfield	24·39	82·98	340
5	Carmel	17·24	45·40	263
6	Ambanad	16·84	68·09	404
7	Pasuparai	27·11	82·34	304
8	Fairfield	57·46	159·54	277
9	Shoolamalai	39·64	99·85	273
10	Devicolum	47·75	138·55	290
11	Panniar	29·14	99·31	341
12	Elappallay	27·29	74·99	275
13	Kannimalai	42·22	142·74	338
14	Wallardi	36·67	119·81	327
15	Pasumalai	34·92	101·39	290
16	Munnar	35·26	78·84	224
17	Malakkapparai	26·48	76·29	288
18	Sirvani	27·78	81·30	293
19	Varadimalai	33·83	100·74	298
	All Estates	617·29	1,815·78	294

TABLE VI
Distribution of Loans and their purpose

Serial No.	Name of Estate	Purpose							
		Domestic purpose		Capital expenditure		Education		Medical	
		Amount Rs. nP	No.	Amount Rs. nP	No.	Amount Rs. nP	No.	Amount Rs. nP	No.
1	2	3	4	5	6	7	8	9	10
	All Estates	17,219 56	163	2,671 63	13	265 00	4	2,094 54	20
1	Ponmudi	1,640 00	5	2,000 00	1	150 00	1	..	..
2	Bonoccord	1,435 00	10	..	..	..	..	1,000 00	3
3	Isfield	1,173 00	11	95 00	1	..	..	400 00	1
4	St. Marys	2,326 00	13	41 63	5	..	..	113 54	2
5	Carmel	715 00	10	..	..	..	..	84 00	2
6	Ambanad	96 00	4	..	..	25 00	1	35 00	1
7	Kannimala	1,790 00	18	300 00	1	..	..	..	..
8	Devicolum	3,010 00	9	..	..	..	..	..	..
9	Munnar	642 00	16	100 00	2	..	..	150 00	1
10	Choolamala	1,244 00	24	..	..	90 00	2	10 00	1
11	Fairfield	180 00	3	..	..	..	..	115 00	5
12	Pasuparai	945 00	14	24 00	1	..	..	130 00	2
13	Wallardy	1,465 00	7	..	..	..	..	..	..
14	Pasumala	750 00	3	..	..	..	..	..	..
15	Panniyar	200 00	2	..	..	..	..	..	..
16	Elappally	548 00	13	..	..	..	..	..	..
17	Malakapara	60 00	1	60 00	1	..	..	..	..
18	Varadimala	..	..	50 00	1	..	..	47 00	1
19	Sirvani	..	..	..	..	..	..	10 00	1

TABLE VI—(cont.)

Serial No.	Name of Estate	Purpose							
		Ceremonial		To repay loan		Others		Total	
		Amount	No.	Amount	No.	Amount	No.	Amount	No.
		Rs. nP		Rs. nP		Rs. nP		Rs. nP	
		11	12	13	14	15	16	17	18
	All Estates	5,640 00	15	426 00	8	2,601 25	24	30,917 98	247
1	Ponmudi	2,115 00	2	..	..	100 00	1	6,005 00	10
2	Bonoccord	300 00	1	..	..	..	..	2,735 00	14
3	Isfield	550 00	1	..	..	..	..	2,218 00	14
4	St. Marys	1,065 00	3	65 00	2	..	..	2,611 73	25
5	Carmel	..	..	..	..	..	..	799 00	12
6	Ambanad	..	..	..	..	..	..	156 00	6
7	Kannimala	300 00	3	..	..	..	..	2,390 00	22
8	Devicolum	300 00	1	..	..	..	..	3,310 00	10
9	Munnar	..	..	..	..	..	..	892 00	19
10	Choolamala	..	..	38 00	3	..	..	1,382 00	30
11	Fairfield	..	..	108 00	2	60 00	1	463 00	11
12	Pasuparai	60 00	1	..	..	2,000 00	4	3,160 00	22
13	Wallardy	880 00	2	..	..	300 00	5	2,615 00	14
14	Pasumala	130 00	1	..	..	..	..	850 00	4
15	Panniyar	..	..	..	..	..	..	200 00	2
16	Elappally	..	..	..	..	91 25	12	639 00	25
17	Malakapara	..	..	..	..	50 00	1	170 00	3
18	Varadimala	..	..	..	..	..	..	97 00	2
19	Shirvani	..	..	215 00	1	..	..	225 00	2

Table VII—Average consumption per adult per day and its constituents

Serial No.	Item	Consumption per adult per day (Ozs.)	Caloritic value	Calcium (Mg.)	Proteine (Gms.)	Iron (Mgms.)
1	2	3	4	5	6	7
1	Rice ..	20·97	2,055·06	62·91	37·75	12·58
2	Other Cereals ..	0·50	49·00	7·00	1·70	0·75
3	Tapioca ..	4·19	188·55	41·90	0·84	0·84
4	Pulses ..	2·20	211·20	118·80	11·44	5·50
5	Green and Kaky Vegetables ..	2·19	..	..	..	..
6	Potatoes ..	1·11	31·08	3·33	0·55	0·22
7	Tubers ..	0·38	10·64	5·70	0·11	0·08
8	Mutton ..	0·34	18·70	14·62	1·80	0·24
9	Beef ..	0·29	9·28	0·87	1·86	0·06
10	Fresh fish ..	0·33	9·24	5·61	2·01	0·23
11	Dry fish ..	0·82	..	..	..	..
12	Oils and Fats ..	0·68	..	..	..	..
13	Milk ..	3·17	57·06	107·78	2·85	0·32
14	Curd ..	0·10	1·40	3·40	0·08	0·01
15	Banana ..	0·11	4·73	0·33	0·04	0·01
16	Other plantains ..	0·32	9·60	0·96	0·10	0·03
17	Sugar ..	0·31	..	..	..	..

Table VII—Average consumption per adult per day and its constituents—(cont.)

Serial No.	Item	Consumption per adult per day (Ozs.)	Calorific value	Calcium (Mg.)	Proteine (Gms.)	Iron (Mgms.)
1	2	2	4	5	6	7
18	Jaggery ..	1.59	173.31	36.57	0.16	5.09
19	Salt ..	1.20	..	..	..	..
20	Turmeric ..	0.08	7.92	3.44	0.14	0.42
21	Chillies green ..	0.22	2.64	1.76	0.18	0.07
22	Chillies dry ..	0.29	20.30	13.05	1.31	0.20
23	Tamarind ..	0.38	..	..	..	..
24	Onions ..	0.85	14.45	8.50	0.43	0.26
25	Garlic ..	0.06	2.40	0.48	0.11	0.02
26	Corriander ..	0.25	20.50	45.00	1.00	0.28
27	Ginger ..	0.04	0.76	0.24	0.03	0.03
28	Pepper ..	0.03	1.29	2.10	0.04	0.02
	Total ..	..	2,899.11	484.35	64.53	28.26

Table VIII—Constituents of certain items of food

Serial No.	Commodity	Protein Gms. (Oz.)	Calcium Mgm. (Oz.)	Iron Mgm. (Oz.)	Caloric Value (Oz.)
1	2	3	4	5	6
1	Rice	1.8	3	0.6	98
2	Wheat	3.4	14	1.5	98
3	Tapioca	0.2	10	0.2	45
4	Greengram	6.8	40	2.4	95
5	Blackgram	6.8	60	2.8	99
6	Bengalgram	4.9	54	2.8	103
7	Horsegram	6.3	80	2.1	91
8	Dhal	6.3	40	2.5	95
9	Potatoe	0.5	3	0.2	28
10	Tubers	0.4	15	0.3	28
11	Mutton	5.3	43	0.7	55
12	Beef	6.4	3	0.2	32
13	Egg (Hens)	3.8	17	0.6	49
14	Egg (Ducks)	3.8	20	0.9	51
15	Cocoanut Seed	1.4	3	0.5	126
16	Gingelly Seed	5.2	410	3.0	160
17	Fish (Fresh)	6.1	17	0.7	28

Table VIII—Constituents of certain items of food—(cont.)

Serial No.	Commodity	Protein Gms. (Oz.)	Calcium Mgm. (Oz.)	Iron Mgm. (Oz.)	Caloritic Value (Oz.)
1	2	3	4	5	6
18	Milk (Cow)	0.9	34	0.1	18
19	Milk (Buffaloes)	1.2	6	0.1	33
20	Milk (Goats)	1.1	48	0.1	24
21	Curds	0.8	34	0.1	14
22	Ghee (Chees)	6.8	390	0.4	101
23	Butter Milk	0.2	8	0.2	4
24	Condensed Milk (Skimmed)	0.7	34	0.1	8
25	Dried Milk (Skimmed powder)	10.7	390	0.4	101
26	Banana	0.4	3	0.1	43
27	Other Plantains	0.3	3	0.1	30
28	Orange	0.3	14	0.1	14
29	Mango	0.2	3	0.1	14
30	Jack fruit	0.5	6	0.1	4
31	Jaggery	0.1	23	3.2	109
32	Turmeric	1.8	43	5.3	99
33	Chillies (Green)	0.8	8	0.3	12

Table VIII—Constituents of certain items of Food—(cont.)

Sl. No.	Commodity	Protein Gms. (Oz.)	Calcium Mgm. (Oz.)	Iron Mgm. (Oz.)	Caloric Value (Oz.)
1	2	3	4	5	6
34	Chillies (Dry) ..	4.5	45	0.7	17
35	Cocoanut ..	1.4	3	0.5	126
36	Tamerind (Pulp) ..	0.9	48	3.1	82
37	Onions ..	0.5	10	0.3	17
38	Garlic ..	1.8	8	0.4	40
39	Coriander ..	4.0	180	5.1	82
40	Ginger ..	0.7	6	0.7	19
41	Pepper (Green) ..	1.4	70	0.7	43
42	Do. (Dry) ..	3.3	130	4.8	87

Source: Public Health Laboratory, Trivandrum.

Table IX—Composition of an actual diet of an adult worker an improved diet and balanced diet

Item	Actual diet of an adult worker		Improved diet		Balanced diet	
	Quantity	Value	Quantity	Value	Quantity	Value
	Ozs.	nP.	Ozs.	nP.	Ozs.	nP.
1	2	3	4	5	6	7
Cereals ..	21.47	36	14	27	14	27
Tapioca ..	4.19	2	..	..	..	..
Pulses ..	2.20	6	2	8	3	8
Green and Leafy vegetables ..	2.19	2	8	9	4	4
Root vegetables ..	0.38	2	6	5	3	3
Other vegetables ..	1.50				2	2
Meat ..	0.63	3	..	..	3	10
Fish ..	1.15	3	..	..
Oils and Fats ..	0.68	5	2	13	2	13
Milk and other Milk products ..	3.27	4	4	5	10	12
Sugar and Jaggery ..	1.90	4	2	5	2	5
Other Items ..	†	21	..	..	1 Egg	12
All Items ..	†	88	†	72	†	96

Note.—† The exact quantities cannot be given here.