

Preliminary Draft
Not to be quoted

CENTRE FOR DEVELOPMENT STUDIES

WORKING PAPER NO.6

FOOD BALANCE SHEET OF KERALA

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October 1972

FOOD BALANCE SHEET OF KERALA*

I. Introduction

What is the extent of undernutrition and malnutrition in Kerala? According to a recent study by Dandekar and Rath — based on the National Sample Survey data on consumer expenditure — 90 per cent of the State's population could not afford in 1961-62 a diet that was adequate even in terms of calories.¹ According to this study, the percentage of such under-nourished people was much lower in other States — being only 13 to 14 per cent of the rural population in Rajasthan, Punjab, Jammu and Kashmir, 18 to 19 per cent in the rural areas of Uttar Pradesh and Gujarat, and between 40 and 60 per cent among the rural population of Orissa, West Bengal, Assam and Tamil Nadu.

Dandekar and Rath assumed that the intake of a certain quantity of foodgrains and substitutes — 615 grams per capita per day in rural areas and 485 grams per capita per day in urban areas — as the minimum necessary to provide the calorie requirement, viz., 2250 per capita per day, and estimated the monthly consumer expenditure that would ensure the same.² On this basis, the level of per capita consumer expenditure at which the requisite amount of

1. V.M. Dandekar and Nilakanth Rath, Poverty in India, Indian School of Political Economy, 1971.

2. Ibid., pp.6-7. A similar procedure was adopted in an earlier exercise to estimate the proportion of the population falling below the poverty line. See, P.D. Ojha, "A configuration of Indian Poverty, Inequality and Levels of Living" in Challenge of poverty in India, ed. A.J. Fonseca, Vikas Publication, 1971.

* The author is grateful to Professor K.N. Raj for many valuable suggestions and to Messrs. P. Ibrahim and M.K. Sukumaran Nair for their help in the compilation and tabulation of data.

calorie is met in Kerala was estimated to range from Rs.34 to Rs.43 in the rural areas as against Rs.8-11 in Rajasthan, Rs.11-13 in Uttar Pradesh and Madhya Pradesh, Rs.13-15 in Jammu and Kashmir, Punjab, Gujarat, Mysore, Bihar and Orissa, Rs.15-18 in West Bengal, Assam, Tamil Nadu, etc. Similarly, the per capita monthly consumer expenditure required to ensure the intake of the requisite calories came to Rs.43-55 in urban areas in Kerala, as against Rs.15-18 in Rajasthan and Uttar Pradesh, Rs.18-21 in Bihar and Jammu and Kashmir, Rs.21-24 in Assam, Madhya Pradesh, Punjab, Haryana, Mysore and Andhra Pradesh and so on.

An attempt was therefore made at the Centre for Development Studies to investigate whether the required nutritional needs could not be met in Kerala at a lower cost. For this purpose, 57 items of food normally available in the State were taken into account, their nutritional properties identified, and their prices in 1970-71 ascertained. The minimum nutritional needs were taken to include not only calories but also proteins, minerals, vitamins, etc. Least cost diets securing the minimum nutritional requirements were then worked out by linear programming, with due allowance being made for palatability.

The main finding of the study (the results of which have been published)³ is that on a monthly consumer expenditure of a little over Rs.34 at the prices prevailing in 1970-71 (which were nearly twice as high as in 1961-62) a person could have a diet which

3. P.G.K. Panikar, Economics of Nutrition, Economic and Political Weekly, Annual Number, February 1972.

yielded all the essential nutrients at the optimum level and, at the same time, provided a reasonable measure of variety and palatability. That is to say, the study has demonstrated that all the minimum nutritional requirements could conceivably be secured in Kerala at about one-half of the cost estimated in the earlier study.⁴

It does not of course follow that there is no under-nutrition or malnutrition in Kerala, or that the scale of such undernutrition and/or malnutrition cannot be very considerable. That would depend upon the level and distribution of income and consumption expenditure.⁵ Assuming that the entire population of the State had incomes sufficient to afford a diet of the kind postulated, are there enough supplies of the different items of food to sustain such a diet for every one? We address ourselves to this question below by attempting to construct a food balance sheet for Kerala.

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4. It may be mentioned that the 57 items covered by this exercise do not include fruits such as mango, jackfruit, banana, etc that are available in plenty in Kerala and are valuable supplements to the diet of the poorest sections of the population.
 5. See "Undernourishment and Malnutrition in Kerala and its implications for Planning", Appendix 4, 'Some Perspectives on Planning and Development with Particular Reference to Kerala', Centre for Development Studies, under publication.

II. Food Balance Sheet

"Food balance sheets show for a country for a specified period the flow of food from production, adjusted for trade, to supplies available for human consumption, taking into account changes in stocks, quantities used for animal food, seed, manufacture and the amounts lost during distribution upto the retail level. They also show the supplies available per capita during that period as well as their nutrient values expressed in terms of calories and some nutrients at the retail level."⁶

A national average of per capita intake of food and nutrients is only a rough approximation and is apt to obscure interregional variations in production, distribution and utilization. Regional food balance sheets would be closer to reality. However, preparation of a regional food balance sheet is a more difficult task and poses serious statistical problems, especially in a developing country. For instance, a region within a country is more "open", while data on inter-regional flows of commodities are not readily available in such a country.

Work on the construction of food balance sheets for Kerala is underway at the Centre for Development Studies. The preliminary results of the exercise are presented below.

Data

The Food Balance Sheets presented below are based on data contained in the several publications of the State Planning Board and the Bureau of Economics and Statistics of the Government of

6. Food and Agriculture Organization of the United Nations, Program of Food Consumption Surveys, Rome, 1964, p.9.

Kerala such as Kerala Economic Review, Statistics for Planning, Fact Book on Agriculture, Agricultural Statistics of Kerala, Season and Crop Reports, etc. A few comments on the source materials will be in order. The estimates of the area and production of rice and tapioca are based on regular crop-cutting experiments. As regards coconuts, a series of sample surveys were conducted by the Bureau of Economics and Statistics from 1959-60 through 1965-66 for estimating the area under and production of this crop. Current production estimates are based on the estimated number of coconut palms per hectare, proportion of bearing trees and yield of nuts per tree estimated on the basis of "conventional yield rate adjusted to declining trend". The figures of marine fish landings are furnished by the Central Marine Fisheries Research Station. Estimates of production of milk and eggs are worked out with data from the quinquennial Livestock Census and supplemented by the results of a Sample Survey conducted during 1964-65. The Quarterly Bulletin of Animal Husbandry Department contains statistics of animals slaughtered in licenced slaughter houses in Municipalities and Panchayats. Estimates of production of other cereals and millets, pulses, oil seeds like sesame and groundnuts, fruits, sweet potatoes, sugarcane, etc. are derived from forecast reports which are themselves based on Land Utilization Surveys for area under different crops and conventional crop estimates for yield rates.

Data on the exports of tapioca, coconuts, copra, coconut oil and fish are published regularly. However, their coverage may

be incomplete. For instance, in official statistics full account is not taken of exports other than through seaports which in certain cases could be a significant amount. Thus, the estimates of the exports of coconut, copra, coconut oil, tapioca, eggs etc. are only rough approximations. Data on the imports of certain food items, especially of foodgrains like rice and wheat imported on Government account for distribution through fair price shops, are available in the Administration Reports of the Bureau of Economics and Statistics and Kerala Economic Review; the calendar year figures are converted in terms of agricultural year, July to June, with appropriate adjustments. But no such figures are available on the imports of other items like pulses, sugar and vegetable oils in which case the bulk of domestic consumption is met out of imports. In brief, the coverage, rigour and accuracy of the data vary from commodity to commodity.

Assumptions:

The assumptions underlying the estimates are as follows: Domestic utilization by way of animal feed, seed and waste is reckoned at the same rates as that underlying the Food Balance Sheet of India 1960-62 published by the F.A.O.⁷ We also apply the same extraction rates. The relevant rates are given alongside of Table I.

7. Food and Agriculture Organization of the United Nations, Food Balance Sheets, 1960-62, Rome, 1966.

True, there are apt to be significant interregional differences in respect of each of these items. For instance, the seed rate depends upon the particular variety sown and would, therefore, vary between varieties and between localities.

(Incidentally, the seed rate of the new high-yielding varieties of rice, which were introduced after the mid-sixties in our country, is known to be lower than that of the conventional varieties.) Similarly, the proportion of food output fed to animals would also vary between regions. In a State Like Kerala with a chronic deficit in foodgrains, the proportion of foodgrains used as animal feed is likely to be lower than in many other parts of India. The same would be true of the extent of waste upto the retail level. However, there is no statistical basis for modifying these ratios as would reflect the actual conditions in Kerala. Therefore, the national averages are applied which, after all, are themselves of the nature of rough approximations. More specific assumptions underlying the estimates are given below.

Regarding the manufacture of non-food items from total production, we have nothing better to go by than mere hunches. For instance, in the case of tapioca, we have assumed that 50 per cent of tapioca produced in Kerala is consumed as food within the State, after allowing for exports and manufacture of non-foodstuff. According to Civil Supplies authorities, 20 per cent of domestic production goes into industrial use and 20 per cent leaves the State as exports. According to another estimate about 47 per cent

of the output is consumed as food.⁸ As regards coconut, it is estimated that about 50 per cent of total output is processed into copra and then converted into oil. In addition to conversion of coconuts into copra, a certain proportion may be going into confectionary items and some amount of coconuts exported as such. Coconut is an indispensable ingredient in most food preparations among all groups, but there is no way of estimating the quantity consumed as kernel. According to one Sample Survey in 1959 conducted by Bureau of Economics Studies, about 14 per cent of the output of coconut among the Sample households was reported as consumed by the producing households.⁹ However, it may be noted that the sample comprised only cultivating households, who owned and/or possessed the sample plots. Further, the sample has a slight bias towards large cultivators, who would usually sell a greater proportion of their output and require only a smaller proportion for household consumption. An allowance has to be made for households which do not own any land where coconut is grown and their number is substantial. Another study has yielded the estimate that 47 per cent of coconut production is used for edible purposes.¹⁰ We here assume that 40 per cent of

8. Directorate of Marketing and Inspection, Report on the Marketing of Tapioca, Government of India, 1955.

9. Bureau of Economics Studies, Survey of Distribution of Agricultural Produce, Government of Kerala, Trivandrum, 1961.

10. Directorate of Marketing and Inspection, Report on the Marketing of Coconuts, Government of India.

the output is consumed as kernel.

Reference Period:

The Food Balance Sheet presented below relates to the mid-sixties; the production and distribution figures represent a three-year average from 1963-64 to 1965-66. It may, however, be mentioned that the average could be slightly depressed by the subnormal output of foodgrains during 1965-66. During this year the rainfall in Kerala was only 2209 millimetres, very much below the normal rainfall of about 2986 millimetres. The index of foodgrains production (1956-1957 = 100) dropped from 125.8 in 1964-65 to 112.1 in 1965-66. But on the other hand, the output of certain other food items like tapioca and fish maintained a rising trend over this period.

FOOD BALANCE SHEET, KERALA

PRODUCTION AND DISTRIBUTION

Population: 184.78 Lacs

3 Year average 1963-64/1965-66.

(Metric Tons)

Commodity	Production	Changes in Stock	Foreign Trade		Distribution			Waste	Food gross	Extraction rate per cent	
			Gross exports	Gross imports	Available supply	Animal feed	Seed Manufacture				
<u>Cereals</u>											
Rice	1625000	...	...	1210702	2835702	6500	99125	...	198499	2531578	66.7
Wheat	.....	...	...	184804	184804	.....	.....	...	.....	184804	.....
Jowar	533	...	...	.....	533	6	18	...	30	479	.....
Ragi	7360	...	...	.....	7360	.....	147	...	147	7066	90.0
Other cereals and millets	3163	...	...	.....	3163	.....	95	...	63	3005	95.0
<u>Starchy food</u>											
Sweet potato	35295	...	...	.....	35295	.....	.....	...	.....	39295	.....
Tapioca	2794276	...	558855	.....	2235421	.....	.....	558855	.....	1676566	.....
Sugar	.....	...	...	.....	.....	.....	.....	...	.....	.....	.....
<u>Pulses, nuts & Oil</u>											
<u>Seeds</u>											
Pulses	17030	.....	...	60000	77030	3851	852	...	1925	70402	.....
Coconuts	1538000	.....	40404	.....	1597596	.....	32760	819000	16380	729456	.....

Table continued from pre-page

Commodity	Production	Change in stock	Foreign Trade			Distribution				Food gross	Extrac rate per ce
			Gross exports	Gross imports	Available supply	Animal feed	Seed	Manufacture	Waste		
<u>Fruits</u>											
Bananas	342770	...	.....	.....	342770	.....	.....	.....	61699	281071	....
Mangoes	539000	...	.....	.....	539000	.....	.....	.....	115020	523980	....
Jackfruit	529550	...	.....	.....	529550	.....	.....	.....	95319	434231	....
Pineapple	63130	...	.....	.....	63130	.....	.....	.....	11636	51767	....
Pappayya	36250	...	.....	.....	36250	.....	.....	.....	6525	29725	....
<u>Meat</u>											
Goat, buffalo, beef	16969	...	.....	.....	16969	.....	.....	.....	16969	16969	....
Poultry meat	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	....
<u>Eggs</u>											
Hen's egg	21304	...	5167	.....	16137	.....	2982	.....	1315	13155	....
<u>Fish</u>	339630	...	9179	.....	325451	.....	.....	.....	33463	291988	....
<u>Milk</u>											
Cows'	156123	...	.....	.....	156123	.....	.....	.....	.....	156123	....
Buffaloes'	48237	...	.....	.....	48237	.....	.....	.....	.....	48237	....
Goats'	16476	...	.....	.....	16476	.....	.....	.....	.....	16476	....
<u>Oils and fat</u>											
Coconut oil	234000 (Copra)	.....	9908	7108	.....	.....	.....	.....	.....	231200	62.0
Sesame oil	2457	.....	.....	.....	2457	.....	74	.....	.....	2383	40.0



NOTES OF TABLE I AND II

The following ratios, have been adopted from the F.A.O. Food Balance Sheets of India, 1960-62 and 1964-66.

Commodity	Animal feed	Seed	Waste	Extraction rate
Rice	0.4	6.1	7.0	66.7
Wheat		...	3.0	....
Jowar	1.2	3.4	5.7	....
Ragi	Negligible	2.0	2.0	90.0
Other cereals and millets	-do-	3.0	2.0	95.0

Starchy food

Estimates of production of sweet potato for the period under reference, 1963-64 to 1965-66, are not available. The production figure given here covers the period 1966-68.

Sugar

Data relating to the production and import of sugar, gur etc. for the period under reference are not available. A lion's share of internal consumption of sugar is met by imports from other States. The per caput consumption, viz., 25.19 grams per day, is the figure reported through the National Sample Survey, Seventeenth Round, 1961-62. This includes sugar crystal and gur. Incidentally, the current consumption of sugar, excluding gur and jaggery, in Kerala (1971-72) is estimated at 132000 tonnes per year, internal production by three sugar factories in the State comes to 13450 tonnes. This would work out to 20 grams per caput per day.

Pulses and Oil Seeds

Imports of pulses by rail relating to 1963-64, given in Commodity Transport Studies, Planning Commission, 1968, are used here: data for the other two years under reference are not readily available. Nor is there any estimate of the arrival of pulses and nuts by road. The estimated number of coconuts produced is converted into tonnes at the rate of 1/2 Kg. per nut.

Fruits

Data relating to the production of fruits are rather spotty. Published data include only bananas and other plantains. Statistics relating to other fruits have been furnished by the Farm Information Bureau of the Government of Kerala and relate to the period 1966-67.

The rate of wastage assumed here, viz. 18 per cent, is the same as that assumed in the F.A.O. Food Balance Sheet for India. Calories, Proteins and fat of different food items are estimated with the help of the food composition tables given in the I.C.M.R.'s "Nutritive Value of Indian Foods and the Planning of Satisfactory Diets", 1966.

Meat and Eggs

As mentioned earlier, the numbers of animals slaughtered in the licensed slaughter houses of the State are regularly published by the Animal Husbandry Department. Production of meat is derived on the basis of Slaughter House Statistics of the Live weight and Carcass weight of animals published by the same Department.

The number of hen eggs is calculated on the basis of the estimated number of adult hens (4870647) and average yield (about 29 per year) as reported by the Livestock Census of 1966. According to one estimate (Bulletin of Animal Husbandry Statistics, 1967) 12.4 crores of eggs are exported from Kerala by rail. This forms about a quarter of total production; the rest is assumed as locally consumed. The total number of eggs so estimated is converted at the rate of 12 eggs = $\frac{1}{2}$ Kg. A "seed rate" of 14 per cent is assumed.

The net availability of different food items and their nutrient values are presented in Table II.

Table II

FOOD BALANCE SHEET, KERALA

Population: 184.73 Lakhs

3 Year average 1963-64 to 1965-66

Commodity	Per capita Consumption					
	Net food (tonnes)	Kilogram per year	Gram per day	Calories per day	Proteins per day (grams)	Fat per day
Cereals						
Rice	1688563	91.38	250.35	866.00	18.78	2.50
Wheat	184804	10.00	27.40	94.80	3.23	0.40
Jowar	479	0.03	0.08	0.28	0.01	Negligible
Ragi	6359	0.34	0.94	3.08	0.07	Negligible
Other cereals & millets	2854	1.15	0.41	1.35	0.04	0.01
Total			179.18	965.51	22.13	2.92
Starchy Food						
Sweet potato	35295	1.90	5.23	6.78	0.05	0.02
Tapioca	1397122	75.61	207.15	325.23	1.45	0.41
Total	....	....	212.38	332.01	1.51	0.35
Sugar	....	....	25.19	100.26	....	....
Pulses, nuts and oil seeds						
Pulses	66882	3.62	10.00	34.00	1.24	0.21
Coconuts	655200	35.46	97.15	431.35	4.37	40.41
Total	....	....	107.15	465.35	5.61	40.62
Fruits						
Banana & Other plantains	281071	15.21	41.67	43.33	0.46	0.04
Mangoes	523980	28.27	77.45	39.50	0.46	0.77
Jackfruit	434231	23.43	64.28	56.47	1.22	0.06
Pineapple	51767	2.79	7.65	3.51	0.03	0.01
Papaya	29725	1.60	4.39	1.40	0.02	0.01
Total			195.34	144.21	2.19	0.89

Table continued from pre-page

Commodity	Per capita Consumption					
	Net food (tonnes)	Kilogram per day	Gram per day	Calories per day	Proteins per day	Fats per day
<u>Meat</u>						
Goat, Buffalo, beef	16969	0.90	2.48	2.88	0.55	0.08
Poultry meat		0.01	0.03	0.03	0.01	Negligible
Total			<u>2.51</u>	<u>2.91</u>	<u>0.56</u>	<u>0.08</u>
<u>Eggs</u>						
Hen eggs	13155	0.71	1.94	3.35	0.26	0.26
<u>Fish</u>	291988	15.80	<u>43.29</u>	<u>41.56</u>	<u>7.90</u>	<u>0.75</u>
<u>Milk</u>						
Cow's milk	156123	8.43	23.10	15.48	0.70	0.90
Buffalo milk	48237	2.59	7.10	3.03	0.11	0.20
Goat milk	16474	0.88	2.40	0.63	0.02	0.03
Total			<u>32.60</u>	<u>19.14</u>	<u>0.83</u>	<u>1.13</u>
<u>Oils & Fats</u>						
Coconut Oil	143344	4.73	12.96	116.66	....	12.96
Sesame oil	953	0.05	0.14	1.25	....	0.14
Total			<u>13.10</u>	<u>117.91</u>	....	<u>13.10</u>
GRAND TOTAL				<u><u>2192.21</u></u>	<u><u>40.99</u></u>	<u><u>60.21</u></u>

Note: Calories, proteins and fat of different food items are estimated with the help of the food composition tables given in I.C.M.R.'s Nutritive value of Indian foods and the Planning of satisfactory diets.

It may, however, be noted that the above food balance sheet of Kerala has several important omissions. For want of data on production we have omitted items like duck eggs and meat, inland fish, green leafy vegetables, other vegetables, certain root crops like yam, colocasia, etc. Local consumption of a good number of food items is largely dependent on imports from other States in India, but no data are available on their imports. Potato, oilseeds like groundnuts, sugar and jaggery, vegetable oil like vanaspati, certain fruits like oranges, apples, grapes, etc. It is also possible that certain items are underestimated. For instance, the net availability of pulses could be slightly higher than our estimate. The arrival of pulses by road is not taken into account here. The omission of inland fish and duck eggs would also affect the per caput value of both calories and proteins. Our estimate of meat does not take into account the animals slaughtered outside the licensed slaughter houses.

It appears from this exercise that the supplies of food available in the State towards the middle of the 'sixties would have yielded nearly 2200 calories, 41 grams of protein, and a little over 60 grams of fat. When allowance is made for the omissions the average intake of calories and protein would register a significant rise.

It is difficult to be sure what exactly is the minimum average calorie requirement in the State since it depends on the climate, the occupations of different sections of the people, their body-build, sex, age and several other such factors. The Indian Council of Medical Research has placed the average per capita

requirement of calories at 2400, and of proteins at 44 grams, for India as a whole.¹¹ On the basis of the N.A.C. and F.A.O. allowances for different age groups and 1961 Census data, Sukhatme has worked out the per caput calorie requirement for India which comes to 2100 per day at the physiological level and 2250 to 2300 per day at the retail level.¹² As for fat, the daily intake needed is believed to be in the range of 45 to 60 grams. In this connection it may be noted that the per caput calorie requirement for Ceylon — which is climatically and otherwise similar to Kerala, but has a higher per caput income — has been estimated at no more than 1930 per day.¹³ Incidentally, it may be noted that the per caput intake of calories in Japan was only 1989 at the beginning of the the 'fifties and 2275 by the end of that decade.¹⁴

It is interesting to observe that the availability of calories and proteins per capita per day, as well as their sources, are about the same in Kerala as in Ceylon where the diet is believed adequate to meet average energy requirements. The relevant estimates — derived in both cases from food balance-sheets — are reproduced below:

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11. C.Gopalan, et al, Diet Atlas of India, Indian Council of Medical Research, Hyderabad, 1971, pp.44, 46.
 12. P.V. Sukhatme, Feeding India's Growing Millions, Asia Publishing House, 1965, pp.20-23.
 13. Thambapillai Jogaratnam and Thomas T.Poleman, Food in the Economy of Ceylon (Cornell International Agricultural Development Bulletin 11, October 1969), p.32
 14. Kazushi Okkewa and Nobukiyo Takamatzu, Report of the Survey of Japanese Experiences of changes in Food Habits in Relation to Production Pattern, Asian Productivity Organization, 1971, Table I.

Table III: Food Intake and Their Nutrient Values, Ceylon and Kerala

<u>Commodity</u>	<u>Ceylon</u> (1955-60)		<u>Kerala</u> (1963-66)	
	<u>Calories</u>	<u>Proteins</u>	<u>Calories</u>	<u>Proteins</u>
Cereals	1200	22.6	966	22.1
Rice	950	16.3	866	18.8
Others	250	6.3	100	3.4
Roots and tubers	74	0.6	332*	1.5
Sugar	190	0.0	100	
Pulses and nuts	58	12.7	465@	5.6
Vegetables	28	1.7	N.A.	N.A.
Fruits	9	0.1	144	2.2
Meat	12	0.8	3	0.6
Fish	60	7.1	42	7.9
Eggs	4	0.3	3	0.3
Milk	13	0.7	19	0.8
Fats and oils	477@	0.7	118	0.7
<u>Total</u>	<u>2125</u>	<u>47.3</u>	<u>2192</u>	<u>41.0</u>

* Includes tapioca

@ Includes coconuts

Source: Jogaratnam and Poleman, op.cit., Table 22.

Prima facie, the supplies of food available in Kerala appear to be not much below what would be needed for meeting the minimum nutritional needs of the people. If this assessment of per capita availability of food in Kerala is correct, such undernutrition and malnutrition as exist in the State must be attributed mainly to inequalities in the distribution of the available supplies. The extent of these inequalities, in respect of some of the main items of food, will be evident from the following data relating to 1961-62.

Table IV: Distribution of Expenditure on Different Food Items
Among Different Expenditure Groups

Decile	<u>Percentage Share of each Decile in Total Expenditure on:</u>			
	<u>Cereals and Cereal Substitutes</u>	<u>Pulses</u>	<u>Milk and Milk products</u>	<u>Other food items</u>
First	13.3	28.2	32.9	21.4
Second	11.7	16.3	17.0	14.8
Third	11.0	12.6	12.4	12.4
Fourth	10.7	10.3	9.8	10.7
Fifth	10.0	8.5	7.8	9.4
Sixth	9.6	7.2	6.4	8.4
Seventh	9.3	5.9	5.1	7.3
Eighth	8.8	4.9	3.9	6.4
Ninth	8.2	3.7	3.0	5.4
Tenth	7.4	2.4	1.7	3.8
	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>
Lorenz ratio	0.17	0.38	0.45	0.27

Estimated from the National Sample Survey, Seventeenth Round, Number 135, September 1961 - July 1962.

Conclusion

A major policy question to be faced in planning is to what extent the problems of undernutrition and malnutrition in the State can be solved through measures for more equitable distribution of the available supplies of items of food like pulses and milk, and to what extent they require expanding the output of specific items needed to meet the nutritional deficiencies. The food balance sheet shows considerable imbalance in Kerala's dietary pattern. The output and intake of protective food like pulses and legumes, milk, eggs, meat etc. are seen to be very low. Hitherto, in Kerala,

the accent was placed on self-sufficiency in rice so much so that other, more nutritious, food crops were neglected. This imbalance should be redressed in the future plans. With moderate finance, extension and organizational effort, the production of these non-cereal foodstuffs could be considerably enlarged.

At the same time, a more equitable distribution of the available supply deserves equal emphasis. The following observation of Dr. P.V. Sukhatme is of particular relevance in this context:

"The green revolution will undoubtedly help to increase the supply of foodgrains but increasing supply in itself will not be adequate to solve the problem of uneven distribution.....It is therefore important that we involve the small farmer as fast as we can into the effort of production, not only of crops but of milk as well..... It has been aptly said that 'it is not food, but the small farmer which is the dark spot of the future'."¹⁵

Dr. Sukhatme adds:

"It would appear.....prudent that we do not create dietary variety more than we can help by encouraging factory production of semi-conventional foods which, in any case, have little to offer by way of nutritional value over and above the cereal/pulse diet. Far from closing the so-called protein gap, it is not unlikely that such production will only help to widen it. Rather, our aim should be to try and integrate wherever possible food production, distribution and employment. Even if adequate supplies of protein-rich foods are available, they would not be of help in the solution of the problems of malnutrition if the poor cannot afford to buy adequate amounts of foodgrains and are even less likely to afford protein-rich food for their children".

21-10-1972

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15. P.V.Sukhatme, "Protein Strategy and Agricultural Development", Presidential Address delivered on the occasion of the 31st Annual Conference of the Indian Society of Agricultural Economics in March 1972, Indian Journal of Agricultural Economics, Vol. XXVII, No.1, January-March 1972.