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SOME ECONOMIC ASPECTS OF NUTRITIONAL DEFICIENCY (A CASE STUDY OF A SMALL TOWN IN ANDHRA PRADESH)

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I

SCOPE OF THE STUDY

An attempt is made in this paper to investigate from the economist's angle the nature and dimensions of undernutrition and malnutrition in a small town in Andhra Pradesh, namely, Anakapalle. The relevant information is drawn from the data collected for a broader and intensive study of poverty and inequalities in the same town undertaken by one of the authors. The main argument of the paper is that the problem of undernutrition and malnutrition is basically a problem of very unequal distribution of incomes, and absolutely low incomes for a high proportion of the population.

Recent studies of income and expenditure distributions and poverty in India, measuring poverty on the basis of minimal food energy need, have clearly brought out the fact that undernutrition constitutes a pervasive and persisting mass phenomenon in the country.[1] The low rate of economic growth and very unequal distribution of incomes are to be considered as the major causes of this phenomenon. Economists are broadly justified in considering that the task of providing minimum levels of nutrition to the people is basically one of adequate production and proper distribution of food, which in their turn depend upon an appropriate distribution of incomes and productive resources. Socio-cultural and environmental factors have no doubt an important role in determining the nutritional levels.[2] Consumption patterns and food habits, methods of preparing and consumption of food, methods of preserving food, availability of protected drinking water, incidence of intestinal worms which reduces the effective value of food consumed, etc., have to be given due weight in the consideration of nutritional policies. The costs of bringing about favourable changes in these respects have to be carefully looked into. But the importance of these factors should not be exaggerated when we are dealing with the widespread phenomenon of undernutrition and malnutrition, and when we are concerned with deficiencies below the critical points of survival and minimum level of living.[3]

The effects of undernutrition and malnutrition on the physiological and psychological development of children and on the economic determinants

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1. See, especially, V. M. Dandekar and Nilakantha Rath: Poverty in India, Indian School of Political Economy, Poona, 1972 and *Sankhya* (The Indian Journal of Statistics), Vol. 36, Parts 2 and 4, June and December, 1974 (Statistical Publishing Society, Calcutta).
2. Margaret Mead: Cultural Patterns and Technical Change, UNESCO, 1954, pp. 211-221.
3. Jan Drewnowski: Studies in the Measurement of Levels of Living and Welfare, United Nations Research Institute for Social Development, Geneva, 1970, pp 6-8.

of labour productivity have also received a great deal of attention by the medical workers and social scientists. It is now widely recognized that undernutrition and malnutrition constitute important links in the chain of events which lead to the persistence of sub-optimal living under conditions of semi-starvation and ill-health and disease.[4] For the poverty households, deficient nutrition leads to lowered energy output and production, and incomes. It also leads to decreased resistance to disease, high death rates in children and lower life expectancy. It further means poor and meagre education for children. Raising the nutritional level therefore would result in improvements at all links of this chain. It has an instrumental value because it tends to raise work efficiency and productivity, apart from its human value for promoting welfare.[5]

In empirical analysis of the economic aspects of the problem of deficient nutrition, attention has to be focused mainly on how nutritional levels are related to levels of income or assets, total expenditure and expenditure on food in the case of specific target groups and for different regions in the country. Analysis of the behaviour of food expenditure in relation to the total expenditure or income of households, on a per capita basis, has been a part of the conventional analysis in this area of research. However, an equally important aspect for examination is the behaviour of such variables as energy value of food, protein intake, calorie-protein balance, and food composition in relation to the levels of food expenditure. The object of this paper is to throw light on these aspects of the problem. In view of the limitations of data, no attempt will be made to analyse the relationships between nutritional level and such variables as work attitudes and aspirations, labour productivity, fertility and death rates, etc. The question of raising the levels of nutrition through technological changes in production, preparation and consumption of food and the costs involved will not also be considered.

II

DESIGN OF SAMPLE SURVEY AND DETERMINATION OF NUTRITIONAL DEFICIENCY

Anakapalle is a small trading town in the Visakhapatnam district of Andhra Pradesh. It is one of the biggest market centres for jaggery in India. According to the 1971 Census, the town had a population of 57,273. The occupational distribution of workers shows that commerce and trade is the dominating occupation, followed by services and industry (manufacturing and household). Cultivation and agricultural labour are also important occupations.

4. (U. S.) President's Science Advisory Committee: The World Food Problem, Vol. II—Report of the Panel on the World Food Supply, The White House, Washington, D.C., U.S.A., 1967, Chapter 1, especially pp. 5-8.

5. Gunnar Myrdal: Asian Drama: An Inquiry into the Poverty of Nations, Vol. III, Twentieth Century Fund, Inc., U.S.A., Pelican 1968, Appendix 2, Section 21.

OCCUPATIONAL DISTRIBUTION OF WORKERS

(*per cent*)

Workers	29.81	Cultivators	12.70
Non-workers	70.19	Agricultural labour	10.91
	100.00	Household industry	3.25
		Manufacturing, etc.	11.19
		Trade and Commerce	28.31
		Transport	9.98
		Other services	20.29
		Others	3.37
			100.00

For the purpose of the sample survey, the division of the town into 20 localities, made by the Municipality, was taken as the basis for the selection of localities and households. The 20 localities have been stratified into five relatively homogenous groups on the basis of the occupational pattern and economic status of the households in the locality. One locality from each group was then selected. A total sample of 300 households was taken from the five selected localities for intensive study of poverty and inequality in the town on a random basis with the number from each locality being proportionate to its size. Detailed information about demographic and occupational features, incomes, expenditures, consumption patterns, etc., was collected from the sample households for the period July, 1973-June, 1974, using detailed questionnaires and schedules in interviewing the respondents. Great care has been taken to ensure reliability of the responses.

For the purpose of the present paper, the sample households have been classified according to per capita per day expenditure and distributed in 12 size-groups ranging from less than one rupee to above eight rupees. The calorie and protein value of the food consumption of the households is calculated by taking into account the quantities of various food items consumed and the Aykroyd tables of nutritive value of Indian foods.[6] As regards the calculation of adult man-units (consumption units) of the sample households, the conversion coefficients as suggested in the same Aykroyd tables are used. For the estimation of incomes and expenditures of the households, standard procedures are adopted.

In determining the critical point of the basic need for nutrition, we have taken about 2200 calories per capita per day as the minimum amount of energy required for the households in all the size-groups without any distinction. In the analysis of the data presented in this paper, the dividing line

6. W. R. Aykroyd: The Nutritive Value of Indian Foods and the Planning of Satisfactory Diets, Nutritional Research Laboratories, Indian Research Fund Association, Coonoor, 1951.

indicating the nutritional deficiency level is thus drawn in all the tables below the expenditure group of Rs. 3.00 to 3.50, the per capita per day dietary energy in this group being 2165 calories. This means that all households with per capita per day expenditure below Rs. 3.00 fall below the nutritional deficiency line or the poverty line in terms of nutritional standard. The corresponding norm of calorie intake per adult man-unit per day comes to 2429 calories.

III

LEVELS OF INCOME, EXPENDITURE AND NUTRITION

In Tables I and II, household data particulars relating to population, incomes, expenditures and nutritional value of food consumption are presented according to expenditure groups and also for the households above and below the nutritional deficiency line. The tables bring out clearly the fact that expenditure on food increases as total expenditure increases, though the percentage in total expenditure rapidly decreases.

30.63 per cent of the population who are above the nutritional deficiency line receive 65.90 per cent of the total income and there is a steady increase in the per capita intake of calories for them as expenditure (and income) increases. In contrast, 69.37 per cent of the population are below the nutritional deficiency line. They receive 34.10 per cent of the total income and their per capita calorie intake rapidly decreases as expenditure and income decrease. The status of the lowest two expenditure groups in these respects is particularly distressing. The members of these two groups constitute 26.48 per cent of the total population, receive only 7.67 per cent of the total income of the households and their per capita energy intake is only 1054.2 calories. These groups constitute the destitute and starvation groups of the town.

The calorie intake depends mainly on expenditure on food which in turn depends on income. It is reasonable to expect that each one of these variables will be significantly correlated with the other two variables. An attempt is made to test the extent of this dependance statistically. The results show that the correlation coefficient between total expenditure and calorie intake is .75 and the correlation coefficient between per capita expenditure and per capita income is found to be .76.

Table II also gives data relating to deficiency of calorie intake and expenditure gap for the households below the nutritional deficiency line. For these households the deficiency of calorie intake per capita per day increases very rapidly from 306 to 1322 calories as expenditure and income decrease, and the gap in expenditure similarly increases rapidly from 13.8 per cent to 73.3 per cent. The expenditure of these households per head

TABLE I.—NUMBER OF HOUSEHOLDS, POPULATION AND INCOME ACCORDING TO EXPENDITURE GROUPS

(Sample Survey of Anakapalle Town, July, 1973-June, 1974)

Sr. No.	Expenditure groups (Rs. per capita per day)	No. of households	No. of members	Percentage of members in total	Cumulative percentage of members	Total income (yearly) (Rs.)	Percentage of income in total	Cumulative percentage of income	Income per capita per day
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1.	Less than 1.00	22	120	7.53	7.53	36,566.00	1.64	1.64	0.85
2.	1.00—1.50	55	302	18.95	26.48	1,34,877.00	6.03	7.67	1.24
3.	1.50—2.00	52	289	18.12	44.60	1,90,807.00	8.54	16.21	1.83
4.	2.00—2.50	41	228	14.30	58.90	2,10,934.00	9.44	25.65	2.57
5.	2.50—3.00	32	167	10.47	69.37	1,89,006.00	8.46	34.11	3.14
	Below nutritional deficiency line	202	1106	69.37		7,62,190.00	34.11		1.91
6.	3.00—3.50	30	157	9.85	79.22	2,12,984.00	9.53	43.64	3.77
7.	3.50—4.00	12	67	4.20	83.42	1,13,601.00	5.08	48.72	4.71
8.	4.00—5.00	20	98	6.15	89.57	2,90,045.00	12.98	61.70	8.22
9.	5.00—6.00	15	72	4.52	94.09	3,08,686.00	13.81	75.51	11.91
10.	6.00—7.00	5	24	1.51	95.60	97,679.00	4.36	79.87	11.31
11.	7.00—8.00	7	35	2.20	97.80	2,16,828.00	9.70	89.57	17.21
12.	Above 8.00	9	35	2.20	100.00	2,33,244.00	10.43	100.00	18.51
	Above nutritional deficiency line	98	488	30.63		14,73,067.00	65.89		8.38
	Overall	300	1594	100.00		22,35,257.00	100.00		3.90

TABLE II—CALORIE INTAKE AND EXPENDITURE GAP

(Sample Survey of Anakapalle Town, July, 1973-June, 1974)

Sr. No.	Expenditure groups (Rs. per capita per day)	Expenditure (per capita per day) (Rs.)	Percentage of food expenditure in total	Calorie intake per capita per day	Index No. of calorie intake per capita per day	Total adult man-units	Calorie intake per adult man-unit per day	Index No. of calorie intake per adult man-unit per day
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1.	Less than 1.00	0.85	70.49	842.6	38.92	96.7	1045.7	43.04
2.	1.00—1.50	1.25	69.30	1138.3	52.57	243.2	1413.5	58.17
3.	1.50—2.00	1.75	66.81	1469.8	67.89	247.5	1716.3	70.64
4.	2.00—2.50	2.27	62.83	1679.8	77.59	195.6	1958.1	80.59
5.	2.50—3.00	2.74	56.85	1859.0	85.86	141.9	2187.8	90.04
	Below nutritional deficiency line	1.77	64.11	1413.3	65.28	924.9	1690.0	69.55
6.	3.00—3.50	3.18	58.17	2165.1	100.00	139.9	2429.8	100.00
7.	3.50—4.00	3.71	53.22	2213.9	102.25	57.7	2570.7	105.80
8.	4.00—5.00	4.51	49.58	2390.5	110.41	86.0	2724.1	112.11
9.	5.00—6.00	5.34	43.49	2398.0	110.76	64.6	2672.7	110.00
10.	6.00—7.00	6.21	39.59	2787.1	128.73	22.5	2972.9	122.35
11.	7.00—8.00	7.37	34.36	2714.8	125.39	30.6	3105.2	127.80
12.	Above 8.00	11.23	33.08	3648.6	168.52	30.4	4200.7	172.88
	Above nutritional deficiency line	4.86	45.80	2427.9	112.14	431.7	2744.5	112.95
	Overall	2.27	54.07	1723.9	79.62	1356.6	2025.6	83.36

(Contd.)

TABLE II—(*Concld.*)

Sr. No.	Expenditure groups (Rs. per capita per day)	Deficiency or excess in calorie intake: Per capita per day	Deficiency or excess in calorie intake: Per adult man-unit per day	Expenditure gap per capita per day	Percentage gap	Calories per rupee of food expenditure	Protein per rupee of food expenditure
(1)	(2)	(10)	(11)	(12)	(13)	(14)	(15)
1.	Less than 1.00	—1322.5	—1384.1	— 2.33	73.27	1404.3	31.8
2.	1.00—1.50	—1026.8	—1016.3	— 1.93	60.69	1308.4	31.8
3.	1.50—2.00	— 695.3	— 713.5	— 1.43	44.97	1256.2	31.7
4.	2.00—2.50	— 485.3	— 471.7	— 0.91	28.62	1174.7	31.1
5.	2.50—3.00	— 306.1	— 242.0	— 0.44	13.84	1191.7	31.2
	Below nutritional deficiency line	— 751.8	— 739.8	— 1.41	44.34	1250.7	31.7
6.	3.00—3.50	—	—	—	—	1170.3	30.3
7.	3.50—4.00	+ 48.8	+ 140.9	+ 0.53	—	1123.8	30.8
8.	4.00—5.00	+ 225.4	+ 294.3	+ 1.33	—	1067.2	30.0
9.	5.00—6.00	+ 232.9	+ 242.9	+ 2.16	—	1033.6	30.3
10.	6.00—7.00	+ 622.0	+ 543.1	+ 3.03	—	1133.0	33.4
11.	7.00—8.00	+ 549.7	+ 675.4	+ 4.19	—	1073.0	31.2
12.	Above 8.00	+1483·5	+1770.9	+ 8.05	—	983.5	30.7
	Above nutritional deficiency line	+ 262.8	+ 314.7	+ 1.68	—	1088.7	30.5
	Overall	— 441.2	— 404.2	— 0.46	—	1172.7	31.1

(income) will have to increase substantially, by 44.3 per cent, if their calorie deficiency is to be made up. It is worth observing in this connection that the 'excess' calorie intake per capita per day of the population above the nutritional deficiency line constituting 30.6 per cent in the total population, is found to be only 262.8 calories as compared with the deficiency of 751.8 calories for the population below the line, constituting 69.4 per cent of the total population. The difference in per capita income between the two categories of households is however substantial and significant. The per capita income of the households above the nutritional deficiency line is found to be Rs. 8.38 as compared with Rs. 1.91 for the others. From the lowest

TABLE III—CALORIE-PROTEIN BALANCE

(Sample Survey of Anakapalle Town, July, 1973-June, 1974)

Sr. No.	Expenditure groups (Rs. per capita per day)	Calorie intake per capita per day (calories)	Protein intake per capita per day (gram)	Protein per 100 calories (gram)
(1)	(2)	(3)	(4)	(5)
1.	Less than 1.00 ..	842.6	19.1	2.27
2.	1.00—1.50 ..	1138.3	27.7	2.43
3.	1.50—2.00 ..	1469.8	37.1	2.52
4.	2.00—2.50 ..	1679.8	44.4	2.64
5.	2.50—3.00 ..	1859.0	48.6	2.61
	Below nutritional deficiencey line ..	1413.3	35.82	2.53
6.	3.00—3.50	2165.1	56.1	2.59
7.	3.50—4.00 ..	2213.9	60.7	2.74
8.	4.00—5.00 ..	2390.5	67.2	2.81
9.	5.00—6.00 ..	2398.0	70.2	2.93
10.	6.00—7.00 ..	2787.1	82.1	2.95
11.	7.00—8.00 ..	2714.8	79.0	2.91
12.	Above 8.00 ..	3648.6	113.9	3.12
	Above nutritional deficiency line ..	2427.9	68.11	2.81
	Overall ..	1723.9	45.71	2.65

level of Re. 0.85 in the bottom group, it rises rapidly and systematically to Rs. 18.51 in the topmost group.

IV

CALORIE-PROTEIN BALANCE AND QUALITY OF FOOD CONSUMPTION

Table III gives data pertaining to calorie-protein balance according to the expenditure groups. The per capita per day protein intake varies substantially between the households above and below the nutritional deficiency line. The estimate of protein intake for the households above the line is 68.11 grams as compared with 35.82 grams for those below the line. It is found to be 56.1 grams at the level of 2165 calories of food energy. The protein intake rapidly increases as the expenditure on food and total expenditure increase. However, it is a matter of considerable interest to find that the calorie-protein ratio (protein per 100 calories) is relatively stable. The ratio varies between 2.27 and 2.61 for the households below the poverty line and between 2.59 and 3.12 for those above the line. This implies that, given the food habits and the energy and protein value of foods, protein intake will rise more or less proportionately when calorie intake rises. For the poor households the problem of protein deficiency can be therefore regarded as essentially a problem of calorie deficiency.[7]

The stability of the calorie-protein ratio also implies that there is little evidence of shift to foods with higher protein value relative to energy value as incomes rise. However, the decline in calories and protein intake per rupee of food expenditure[8] as per capita food expenditure increases, though it is small, shows that food items with less calorie and protein value become important in the food budget as incomes rise. The shifts in the consumption pattern lend some support to this conclusion.

V

CHARACTERISTICS OF HOUSEHOLDS WITH NUTRITIONAL DEFICIENCY

Tables IV and V provide information about some important demographic aspects of the households, presented according to the expenditure groups. The tables bring out clearly the fact that the households below the nutritional deficiency line, though they are in a very low economic condition, have higher propensity to reproduction and higher rate of infant mortality. This is also reflected in the higher proportion of children and higher average household size among these households. The method we have adopted for calculating

7. "Fertility, Aspirations and Resources—A Symposium on the Easterlin Hypothesis," *Population and Development Review*, September/December, 1976.

8. The prices of different foodgrains relative to their energy values may also partly explain this trend.

TABLE IV—DISTRIBUTION OF MARRIED COUPLES, BIRTHS AND CHILD MORTALITY ACCORDING TO EXPENDITURE GROUPS

(Sample Survey of Anakapalle Town, July, 1973-June, 1974)

Sr. No.	Expenditure groups (Rs. per capita per day)	No. of couples	Total years of married life for the women in the couples	Total number of births				Loss of pregnancy (No.)	Loss of pregnancy per year of married life
				Live births	Still births	Total births	Births per year of married life		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1.	Less than 1.00	16	261	70	—	70	0.2682	2	0.0077
2.	1.00—1.50	51	834	194	1	195	0.2338	4	0.0048
3.	1.50—2.00	59	1020	204	5	209	0.2049	4	0.0039
4.	2.00—2.50	49	858	182	2	184	0.2145	16	0.0186
5.	2.50—3.00	34	582	122	3	125	0.2148	8	0.0137
	Below nutritional deficiency line	209	3555	772	11	783	0.2203	34	0.0096
6.	3.00—3.50	30	572	111	1	112	0.1958	7	0.0122
7.	3.50—4.00	17	273	44	—	44	0.1612	3	0.0110
8.	4.00—5.00	21	336	55	—	55	0.1637	4	0.0119
9.	5.00—6.00	13	348	78	—	78	0.2241	6	0.0172
10.	6.00—7.00	6	115	16	—	16	0.1391	3	0.0261
11.	7.00—8.00	10	215	26	—	26	0.1209	2	0.0093
12.	Above 8.00	9	174	21	1	22	0.1264	14	0.0805
	Above nutritional deficiency line	106	2033	351	2	353	0.1736	39	0.0192
	Overall	315	5588	1123	13	1136	0.2033	73	0.0131

(Contd.)

TABLE IV—(*Concld.*)

Sr. No.	Expenditure groups (Rs. per capita per day)	Infant and child mortality					
		Total number of deaths			Number of deaths per year of married life		
		Infants	Children	Total	Infants	Children	Total
(1)	(2)	(11)	(12)	(13)	(14)	(15)	(16)
1.	Less than 1.00	12	—	12	0.0460	—	0.0460
2.	1.00—1.50	39	2	41	0.0468	0.0024	0.0492
3.	1.50—2.00	36	3	39	0.0353	0.0029	0.0382
4.	2.00—2.50	31	3	34	0.0361	0.0035	0.0396
5.	2.50—3.00	17	1	18	0.0292	0.0017	0.0309
	Below nutritional deficiency line	135	9	144	0.0380	0.0025	0.0405
6.	3.00—3.50	21	—	21	0.0367	—	0.0367
7.	3.50—4.00	5	1	6	0.0183	0.0037	0.0220
8.	4.00—5.00	10	1	11	0.0298	0.0030	0.0327
9.	5.00—6.00	12	2	14	0.0345	0.0057	0.0402
10.	6.00—7.00	1	—	1	0.0087	—	0.0087
11.	7.00—8.00	3	1	4	0.0140	0.0047	0.0186
12.	Above 8.00	—	—	—	—	—	—
	Above nutritional deficiency line	52	5	57	0.0256	0.0025	0.0280
	Overall	187	14	201	0.0335	0.0025	0.0360

TABLE V—DISTRIBUTION OF MEMBERS ACCORDING TO AGE AND EXPENDITURE GROUPS

(Sample Survey of Anakapalle Town, July, 1973-June, 1974)

Sr. No.	Expenditure groups (Rs. per capita per day)	Age distribution of members (percentages)					Percentage of adults in total	Percentage of children in total	Average size of household
		0—5	6—14	15—30	31—50	51 and above			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1.	Less than 1.00	16.67	35.00	17.50	22.50	8.33	48.33	51.67	5.45
2.	1.00—1.50	17.88	26.82	24.50	20.86	9.94	55.30	44.70	5.49
3.	1.50—2.00	12.11	26.64	28.03	22.49	10.73	61.25	38.75	5.56
4.	2.00—2.50	10.53	26.75	29.82	22.37	10.53	62.72	37.28	5.56
5.	2.50—3.00	11.97	26.95	29.34	25.15	6.59	61.08	38.92	5.22
	Below nutritional deficiency line	13.83	27.67	26.49	22.42	9.58	58.50	41.50	5.48
6.	3.00—3.50	7.01	28.66	31.21	23.57	9.55	64.33	35.67	5.23
7.	3.50—4.00	13.43	17.91	37.32	19.40	11.94	68.66	31.34	5.58
8.	4.00—5.00	9.18	18.37	40.81	18.37	13.27	72.45	27.55	4.90
9.	5.00—6.00	4.17	25.00	31.94	25.00	13.89	70.83	29.17	4.80
10.	6.00—7.00	—	33.33	29.17	29.17	8.33	66.67	33.33	4.80
11.	7.00—8.00	14.29	17.14	25.72	25.71	17.14	68.57	31.43	5.00
12.	Above 8.00	5.71	20.00	34.29	25.71	14.29	74.29	25.71	3.89
	Above nutritional deficiency line	7.99	23.36	33.81	22.75	12.09	68.65	31.35	4.98
	Overall	12.05	26.35	28.73	22.52	10.35	61.61	38.39	5.31

the number of births and deaths for the existing couples in the households over the period of their married life is subject to some limitations. But it throws sufficient light on the behaviour of the two categories of households regarding births and deaths of children. Undernutrition and malnutrition unfortunately are positively associated with higher birth and infant death rates. The relatively low standard of health of the households below the nutritional deficiency line is indicated by the relatively high death rates of children, as well as by the relatively low average life span as reflected in the age distribution of the members of the households (Table V). A significant conclusion that emerges from this analysis is that the problem of undernutrition has an important demographic dimension, and it must be partly attributed to the burden of relatively higher birth rates and dependency ratio, and expenditures associated with higher mortality rate. Under these circumstances, it is reasonable to expect that undernutrition and malnutrition would be especially severe in the case of the two vulnerable groups of children and pregnant women belonging to the households below the poverty line.

VI

CONCLUSIONS

There are several important conclusions that follow from the above analysis. One is that the nutritional deficiency problem of the households *below the poverty line cannot be solved except by increasing the total food* production and supplies and the purchasing power of the households. Secondly, it is evident that there is considerable scope for increasing their purchasing power through redistribution of incomes in view of the high income disparities. It is of course evident that unless the redistribution of incomes is accompanied by redirection of investment for increasing food production and supplies, the problem will not be solved. In the dynamic context of population growth and, given the high elasticity of demand for food on the part of the poor households, the importance of redistributing incomes in favour of the poor and of redirecting investments in favour of agriculture and food production can hardly be over-emphasized. Thirdly, protein deficiency is very closely related to caloric deficiency. If dietary energy is adequate, it is likely that protein is also adequate. There is no evidence of shift to foods with higher protein and less calorie value as expenditure on food rises. Finally, the demographic pressure on food resources available to the households below the poverty line is significant and can be considered as an independent cause of nutritional deficiency though not as important as the factor of inadequate wages and incomes.