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INTER-STATE VARIATIONS  
IN  
FOOD CONSUMPTION, NUTRITIONAL  
ADEQUACY AND LEVELS OF POVERTY  
(With 15 Companion State Food  
Consumption Profiles)

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**ABBREVIATIONS**

AP	:	Andhra Pradesh
BI	:	Bihar
GU	:	Gujarat
HA	:	Haryana
HI	:	Himachal Pradesh
KA	:	Karnataka
KE	:	Kerala
MP	:	Madhya Pradesh
MA	:	Maharashtra
OR	:	Orissa
PU	:	Punjab
RA	:	Rajasthan
TN	:	Tamil Nadu
UP	:	Uttar Pradesh
WB	:	West Bengal
MPCE	:	Monthly Per Capita Expenditure
NSSO	:	National Sample Survey Organization
WPI	:	Wholesale Price Indices
NIP	:	NSSO Implicit Prices
ICMR	:	Indian Council of Medical Research

## FOREWORD

India is a country with extraordinary regional variations. These variations are captured by a federal structure which juxtaposes Uttar Pradesh with some 125 million population with a Haryana with 15 million. These two states respectively have greater populations than the world's eighth and 52nd largest countries, while the per capita income of the former is less than half of the latter. Overall GNP per capita was \$260 in 1984.

With a view to unravelling the complexity in regional variation, and in an effort to probe the indices of poverty in the society, USAID commissioned the study on "Inter-State Variations in Food Consumption, Nutritional Adequacy and Levels of Poverty". The specific tasks set forth by the USAID were:

- a) to analyze inter-temporal, inter-class, inter-state and rural-urban changes in real aggregate consumption and consumption of food grains, cereals, pulses and other articles of food, the nutritional adequacy of food consumption in terms of calorie and protein intake and balance in diet;
- b) to measure the incidence of poverty in terms of estimated per capita income derived from real expenditure;
- c) to examine possible food grain production and consumption linkages.

Dr. Saroj Gupta, the author, is an economist from Lady Shri Ram College of Delhi University and Honorary Director of Aashish Institute of Scientific Studies which undertook this work on behalf of Techno Economic Research Institute, Delhi. Ms. Mary Ann Anderson, a nutritionist and the Nutrition Advisor to the USAID was responsible for supervising the work and for providing technical guidance.

Dr. Gupta was selected to undertake this study as the collaborator with Dr. Robert E. Evenson, an economist from Yale University, on the predecessor all-India study of "Food Consumption, Nutrient Intake and Agricultural Production in India", which was published by the USAID as its Occasional Paper NO. 3 in October 1986.

I hope that the findings of this study and its 15 companion "Food Consumption Profiles" - one for each of India's 15 major states - will generate further interest in the development community on the complexities of India's poverty phenomenon, and particularly on the methodological issues.

OWEN CYLKE  
DIRECTOR  
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SAROJ GUPTA

EXECUTIVE SUMMARY

India, in the recent past, has accumulated large stocks of foodgrains. This comfortable foodgrain position implies adequate consumption levels or a demand and supply imbalance. This study, therefore, assessed at state level the consumption of foodgrains and other items, nutritional adequacy and levels of poverty in fifteen major states. The study also explored foodgrain production and consumption linkages and determinants of inter-state variations in the levels of poverty.

National Sample Survey Organization (NSSO) consumer expenditure estimates for fifteen states from 1961-62 to 1983 formed the basis of the study. The monetary expenditures reported by NSSO by states were deflated by using All India Wholesale Price Indices adjusted for state specific NSSO price indices and inter-class price ratios, both estimated from NSSO implicit prices based on cereals and pulses in rounds 17 (1961-62), 27 (1972-73), 28 (1973-74) and 32 (1977-78).

In rural areas the average NSSO implicit prices were lower than the all India wholesale prices in all the states except West Bengal and Kerala, the difference being directly related to the level of foodgrain surplus. In urban areas these differences were less pronounced.

The prices paid by the poor were generally lower than the prices paid by the rich in rural as well as urban areas. The grain surplus states had a much lower price difference between the rich and the poor. Relatively greater consumption of coarse grains by the poor and more effort on their part to procure food cheaply explains these differences in the rural areas and the public distribution system is the main explanation in the urban areas.

Significant inter-state variations existed in monthly per capita expenditure (MPCE) on all items in 1961-62. Relatively better off states were Punjab (which included the now Haryana and Himachal Pradesh states), Rajasthan and Karnataka in rural areas and Punjab, Rajasthan, Bihar, West Bengal, Orissa and Maharashtra in urban areas. Kerala, rural and urban, had the lowest MPCE.

Average MPCE declined in all the states from 1961-62 to 1967-68 except in urban Punjab and stayed at the lower levels till the early seventies. It marginally improved thereafter in Gujarat, Kerala, Tamil Nadu, Orissa, Rajasthan, and West Bengal (rural and urban); Andhra Pradesh and Kerala (rural); and Maharashtra and Himachal Pradesh (urban). From 1961-83 average MPCE declined in all the states except Punjab, Haryana and Himachal Pradesh. It declined the most in Bihar and Orissa.

The decline in average MPCE was across the deciles. The total MPCE by decile converged in the mid-sixties and diverged again in the late seventies mainly due to changes in expenditure of upper deciles both in rural and urban areas. By and large the relatively poorer states remained poorer and the better off states better over time. There was little association between rural and urban expenditure levels in the states.

Average expenditure on food and foodgrains (cereals and pulses) closely followed average expenditure on all items. The lower deciles suffered greater losses in food expenditure than the upper deciles except in Punjab. Foodgrain consumption over the deciles showed narrower differences than that of food consumption. Average expenditure on food by the upper expenditure classes was almost double that of the lower expenditure classes.

The composition of cereals consumed changed in this period. Consumption of rice and coarse grains declined in favor of wheat in all the states except Punjab where consumption of rice increased and Tamil Nadu where consumption of coarse grains increased.

In 1961-62, the average calorie intake per person was more than the per capita recommended intake of 2150 established by the Indian Council of Medical Research (ICMR) in all the states except Kerala in rural areas and in seven states viz., Bihar, Haryana, Himachal Pradesh, Madhya Pradesh, Orissa, Punjab and Karnataka in urban areas. In 1983 only Punjab, Haryana, Himachal Pradesh (rural and urban) and Rajasthan (rural) were above this level. Average protein intake was less than the ICMR recommended intake of 45.2 grams in Kerala (rural and urban) throughout the study period and in Andhra Pradesh and Gujarat in 1983 only. The calorie intake of the lowest decile was about 1,100 in all the states except Kerala (500), Punjab and Haryana (1300-1400) in rural as well as urban areas. Urban calorie intake was lower than rural calorie intake.

Throughout the study period, Kerala (rural and urban) was the only state that faced real shortages of cereals, milk as well as pulses, whereas Punjab, Haryana, and Himachal Pradesh were diet adequate states, where even the third decile could get the minimum recommended diet. In 1983, Gujarat lost diet adequacy due to drastic reduction in cereals and pulses and marginal reduction in milk. Bihar and Orissa cereal adequacy was nullified by a shortage of milk and pulses resulting in acute protein deficiency. General reduction in the intake of cereals, pulses and milk during the study period lead to deepening of poverty in most of the states.

The level of foodgrain consumption was found to be negatively associated with the level of foodgrain production. The foodgrain surplus states consumed less foodgrain than the deficit states. The large marketable surplus of foodgrains in three states generated enough income to enable consumers to shift to other kinds of food, particularly milk.

The proportion of poor increased from 1961-68 and reached a peak during 1968-1974 in most of the states in rural as well as urban areas; rural poverty being higher than urban poverty. Poverty levels were over 50% in rural areas and 40% in urban areas. Poverty levels declined from 1974-78, and increased slightly from 1978-83 with an overall decline from 1974-83.

Despite an increase in poverty, the inequalities of income declined, due to a decline in total expenditure of the upper classes. The average expenditure of the poor declined in rural areas and increased marginally in urban areas.

Low irrigation and cropping intensities are important factors leading to the deepening of poverty and differences in levels of poverty between the states.

The other factors marginally influencing levels of poverty between the states are the high proportions of the population who are scheduled caste, scheduled tribe, agricultural labourers, and who have low levels of education. Poorer states have a higher proportion of their population in these groups. Growth in population does not explain differences in levels of poverty across the states. The states with lower levels of poverty in fact, experienced higher population increases.

Combating these high levels of poverty through a well planned grain distribution policy, e.g. food for work, in view of the surplus grains, could be a temporary solution. The real answer lies in increasing the income of the poor, and agriculture in rural areas is still the most important income generating activity. So what is required is extension of facilities of intensive farming to the poor.

## CHAPTER 1

### INTRODUCTION

#### I. Setting the Context

A study on 'Poverty and Nutrition' was undertaken in October 1986 by Dr. R.E. Evenson in collaboration with Dr. S. Gupta for USAID, India. In this report, an attempt was made to bring out the food consumption and poverty scenario in India from 1951 upto 1983 and to link it with food production and other explanatory variables. The study was macro in nature and data were presented for all India rural and all India urban areas. As a follow up to that study it was deemed desirable to do similar analysis of state level data from fifteen states where adequate information was available, in order to make state specific planning and policy analysis possible and to facilitate inter-state comparisons.

The current study, on 'Inter-State Comparisons of Food consumption, Nutrition Adequacy and Levels of Poverty' covers fifteen states viz. Andhra Pradesh, Bihar, Gujarat, Haryana, Himachal Pradesh, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal.

A few relevant recent comparative studies, using NSSO data undertaken in this area, focused on the relationship of rural poverty and agricultural growth. Montek Ahluwalia's (1986) estimates of rural poverty by states did not reflect any effect of level of agricultural production on levels of poverty and, hence, he advocated reliance on off farm poverty eradication programs. Dr. C.H.H. Rao (1985) upholds the importance of agricultural production in poverty eradication programs. The study by Bhattacharya et. al. (1986) did not find any visible trend in the incidence of rural poverty, whereas the authors acknowledged varying patterns of inter-temporal movement in disparities in the level of living in different states.

#### II. Objectives

The study objectives were: (a) to analyze inter-temporal, inter-class, inter-state and rural-urban changes in real aggregate consumption and consumption of foodgrains, cereals, pulses and other articles of food, the nutritional adequacy of food consumption in terms of calorie and protein intake and balance in the diet; (b) to measure the incidence of poverty in terms of estimated per capita intake derived from real expenditure; and (c) to examine possible foodgrain production and consumption linkages.

#### III. Data Base

This study is based on the statewise direct estimates of consumption expenditure on foodgrains and other articles reported by the National Sample Survey Organization (NSSO) from round 17 (1961-62) through round 38 (1983).

The NSSO data background and its limitations are presented in Annexure 2. Statewise estimates were not available for round 19 (1964-65).

#### IV. METHODOLOGICAL ISSUES

NSSO consumer expenditure estimates need to be deflated by indices accounting for price changes over time, items, per capita expenditure classes and states for rural and urban areas separately. NSSO rounds 17, 27, 28 & 32 present per capita expenditure estimates of eight major cereals, total cereals, pulses and grams by per capita expenditure classes in values as well as in quantities for all the fifteen states. Based on this information average and class-wise NSSO prices were calculated. The ratio of class-wise prices to average prices averaged over the rounds and items (Rcj) and the ratio of NSSO price indices to wholesale price indices (Krij) were calculated for each state for rural and urban areas separately. All India wholesale price indices (Iri) were multiplied by these ratios to develop appropriate deflators (Drijc).

$$Drijc = Iri \times Rcj \times Krij.$$

These deflated expenditures were converted through fractile analysis into consumer expenditure by deciles. Nutrition estimates of calorie and protein content of foods consumed were obtained by dividing the expenditure estimates at constant prices by the base year prices and multiplying by nutritive values established by the National Institute of Nutrition (1976). Annexure 2 presents the details of the methodology.

The prices of cereals and other commodities are known to vary over the states. Table 1.1 highlights these differences for cereals for the year 1972-73 in the rural areas. The variation is as much as 100%, Rs. 0.81 per kg. in Punjab to Rs. 1.69 per kg. in Kerala. The ratio of the state prices of cereals as obtained from NSSO data in 1972-73 to the all-India wholesale prices in 1972-73 was built into the deflators by states to adjust the state prices to all-India level (Annexure 2).

The poor in this study are identified as those persons whose calorie intake is less than 2,150 per day, which is the Indian Council of Medical Research's (ICMR) per capita recommended daily intake for Indians. The monthly per capita expenditure equivalent to meet this calorie intake was assessed at Rs. 40 in 1970-71 (Annexure 2). A uniform poverty line across the states is justified in the light of the above price adjustment.

Analysis of per capita consumer expenditure at constant prices in total and on major heads is presented in Chapter 2. Chapters 3 and 4 deal with the analysis of nutritional adequacy, food consumption and foodgrain production and consumption linkages. Chapters 5 and 6 are related to measurement of poverty and its determinants. A short bibliography is found in Annexure 1. The detailed methodology is presented in Annexure 2. Separate reports are also available for each of the fifteen states which provide individual profiles along with detailed figures and tables.

Table 1.1

State NSSO Prices and All India Wholesale Prices : Rural  
(1972-73)

<u>State</u>	<u>Cereals</u>	<u>Rice</u>	<u>Wheat</u>	<u>Jowar</u>	<u>Bajra</u>	<u>Maize</u>
Andhra Pradesh	1.20	1.36	1.33	1.06	0.86	0.97
Bihar	1.36	1.58	1.23	0.80	1.00	1.04
Gujarat	1.30	2.08	1.20	1.30	1.22	1.01
Haryana	0.98	1.24	0.96	1.00	1.03	0.76
Himachal Pradesh	1.12	1.51	1.12	1.00	1.00	-
Karnataka	1.32	1.66	1.13	1.26	1.10	1.12
Kerala	1.69	1.75	0.95	1.00	-	-
Madhya Pradesh	1.03	1.17	0.98	0.84	0.89	0.92
Maharashtra	1.28	1.71	1.11	1.21	1.43	1.17
Orissa	1.20	1.24	1.18	1.00	-	1.00
Punjab	0.81	1.25	0.83	0.75	0.80	0.64
Rajasthan	1.06	1.65	1.09	0.93	1.11	0.97
Tamil Nadu	1.08	1.22	1.14	0.83	0.79	0.86
Uttar Pradesh	1.01	1.30	0.98	0.78	0.81	0.79
W. Bengal	1.42	1.48	1.17	-	-	1.25
All India Wholesale prices	1.31	1.62	1.07	1.05	1.06	0.89

## CHAPTER 2

### ANALYSIS OF CONSUMER EXPENDITURES

#### I. Inter-State Variations in Price Adjustment Factors

Analysis in this section is based on actual consumer expenditures by commodities reported by NSSO by States in the central sample. The monetary expenditures are deflated by using the All-India wholesale price indices adjusted for state specific NSSO price indices and inter-class price ratios, both estimated from NSSO implicit prices in rounds 17 (1961-62), 27 (1972-73), 28 (1973-74) and 32 (1977-78) (see Annexure 2).

In rural areas NSSO implicit prices (NIP) averaged over the rounds are lower than wholesale price indices (WPI). The NIP are substantially lower than the WPI for the North-Western grain surplus states of Punjab (-33%), Haryana (-27%), Rajasthan (-28%) and Uttar Pradesh (-23%). The NIP are marginally lower than the WPI in other states (-14% to -4%). In Kerala and West Bengal, however, NIP are higher than WPI by +15% and +1% respectively. This phenomenon can be attributed to a relative deficiency of foodgrains in these areas (Annexure 2, Table A 2.7). In urban areas, NSSO implicit prices (NIP) are lower than wholesale price indices (WPI) only in a few relatively grain surplus states like Punjab (-21%), Haryana (-22%), Rajasthan (-16%), Uttar Pradesh (-9%) and Madhya Pradesh (-11%). In Himachal Pradesh and Orissa the NIP are close to the WPI. In other states NIP are higher than WPI marginally, except for Kerala where the difference is substantial (+18%) as shown in Annexure 2, Table A 2.8.

NSSO implicit class price ratios indicate that the prices paid by the lower expenditure classes are generally lower than the prices paid by the higher expenditure classes. In rural areas these differences are 7% to 16% in Punjab, Haryana, Uttar Pradesh and W. Bengal, 20% to 36% for other states except Gujarat, and nearing 50% in Gujarat. The states with higher marketable surplus registered a much lower price difference between the rich and the poor. A relatively larger consumption of coarse grains by the lower deciles seems to escalate these differences (Annexure 2, Tables A 2.1, A 2.3, A 2.5).

In urban areas the inter-class price variations are between 14% and 19% for Haryana, Punjab, W. Bengal, Orissa and Tamil Nadu, between 22% and 36% for states other than Maharashtra which registered a difference of 56%. The lower prices of the urban poor reflect the effectiveness of the public food distribution system (Annexure 2, Tables A 2.2, A 2.4, A 2.6).

#### II. Consumer Expenditure : Total

This section presents the analysis of monthly per capita expenditure (MPCE) on all items (total) averaged over all the classes as shown in tables 2.1 to 2.3.

### A. Rural Areas

In rural areas significant inter-state variations in total expenditure are observed. The average total expenditure was about Rs. 40 at 1970-71 prices ranging between Rs. 38 and Rs. 50 for seven out of fifteen states in 1961-62. These states were Andhra Pradesh, Bihar, Kerala, Madhya Pradesh, Orissa, Tamil Nadu and West Bengal. The states of Gujarat, Maharashtra, Himachal Pradesh and Uttar Pradesh were slightly better off, with MPCE varying between Rs. 50 and Rs. 65. The expenditure level was over Rs. 65/- for Haryana, Rajasthan Karnataka and Punjab (Table 2.1).

The average level of expenditure of all the states, except Himachal Pradesh and Kerala, declined in the study period from 1961-62 to 1983. The extent of decline varied between 7% to 35%, with Haryana having the lowest decline and Madhya Pradesh the maximum. Himachal Pradesh had an increase of 5% and Kerala 6%. The decline was very sharp during the sixties pushing Bihar, Kerala, Madhya Pradesh, Orissa, Tamil Nadu and West Bengal in the MPCE range of Rs. 28-35, and Gujarat, Karnataka, Maharashtra, Rajasthan, and Uttar Pradesh in the range of Rs. 35-50. Rajasthan came down drastically from Rs. 79 to Rs. 49; Himachal Pradesh moved up from Rs. 55 to Rs. 59 and Kerala from Rs. 39 to 41. The study period can be divided into two clearly distinct periods, 1961-62 to 1970-71 and 1970-71 to 1983. The decline in MPCE was more a feature of the sixties. During 1961-62 to 1970-71 there was an across the board reduction in the average expenditure. During 1970-71 to 1983, eight states viz. Andhra Pradesh, Gujarat, Karnataka, Kerala, Orissa, Rajasthan, Tamil Nadu, and West Bengal improved marginally but not enough to offset the decline of the sixties, except in Kerala. The decline continued in other states.

Fractile analysis with deciles as fractile groups was undertaken to study the behavior of MPCE of the poor and the rich. The fractile groups were formed after deflating the average MPCE as well as the mpce class-limits. Table 2.1 presents the MPCE, averaged over the 1st, 2nd, and 3rd deciles referred to as lower deciles (LD) and averaged over the 7th, 8th, and 9th deciles referred to as upper deciles (UD). The following observations emerged.

In the early sixties average MPCE declined for all the deciles; more sharply for the upper deciles than the lower deciles. This decline was checked in the mid sixties, and till the early seventies the average MPCE remained constant for all the deciles and states. Thereafter, the signs of improvement started in eight out of fifteen states viz; Andhra Pradesh, Gujarat, Karnataka, Kerala, Orissa, Rajasthan, Tamil Nadu, and West Bengal. Tamil Nadu showed only marginal improvement. In Haryana the lower deciles indicated an improvement but the upper deciles marked a decline. In Madhya Pradesh and Punjab the

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#### Foot Note:

- (1) Level of Haryana and Himachal Pradesh refer to the year 1966-67. These two states were part of Punjab in 1961-62.
- (2) 1983 refers to the calendar year, where as all other reference years are agricultural years, i. e. July to June.

Table 2.1

Inter-State Variations in Monthly Per Capita Expenditure on All Items  
(Rs.: At 1970-71 prices)

Region: Rural

States	1961-62			1966-67			1970-71			1977-78			1983			Percentage Change 1983 over 1961-62		
	A.	L.D.	U.D.	A.	L.D.	U.D.	A.	L.D.	U.D.	A.	L.D.	U.D.	A.	L.D.	U.D.	A.	L.D.	U.D.
Andhra Pradesh	45.14	24.89	56.46	39.46	23.56	49.54	38.17	21.77	42.96	43.45	24.82	50.42	41.73	22.82	48.22	-8	-8	-15
Bihar	42.86	28.25	59.74	36.74	20.43	49.11	34.53	19.96	39.65	34.15	19.88	41.12	32.68	18.80	38.36	-23	-33	-36
Gujarat	59.42	40.72	72.57	40.09	23.61	50.43	41.64	24.01	47.70	49.25	29.63	57.27	45.95	27.01	50.74	-23	-34	30
Haryana	N.A.	N.A.	N.A.	72.27	42.44	89.60	68.30	36.89	80.04	71.37	37.31	84.51	68.13	37.76	80.79	-7	-11	-10
Himachal Pradesh	N.A.	N.A.	N.A.	55.11	35.33	66.84	59.71	36.55	69.88	56.74	34.06	64.86	58.07	32.52	62.30	+5	-8	-8
Karnataka	65.50	34.68	78.08	39.18	22.47	49.19	39.44	21.51	42.09	44.58	23.51	48.52	42.07	22.17	45.36	-36	-36	-42
Kerala	38.95	20.95	53.34	26.03	15.63	33.69	31.41	15.79	35.15	32.18	17.78	44.68	41.21	20.80	47.84	+6	-1	-10
Madhya Pradesh	43.12	34.70	79.86	32.89	23.79	53.11	28.29	20.05	42.18	23.16	18.09	37.55	28.11	21.24	47.19	-35	-39	-41
Maharashtra	50.22	31.06	68.13	39.53	24.21	48.82	41.53	24.80	45.60	55.67	26.05	49.99	40.95	23.29	46.73	-18	-25	-31
Orissa	44.56	23.72	56.05	37.05	21.72	44.99	33.56	16.50	37.01	32.74	17.41	38.65	38.44	20.90	45.90	-14	-12	-18
Punjab	92.89	40.94	111.92	83.81	42.06	90.13	86.55	43.15	98.22	87.92	43.64	106.77	82.54	44.25	101.27	-11	+8	-10
Rajasthan	78.91	39.00	102.73	62.66	32.50	73.30	49.15	23.47	57.16	66.97	34.08	82.54	57.45	27.04	66.89	-27	-31	-35
Tamil Nadu	47.21	25.35	59.76	38.13	22.49	47.57	33.69	18.98	38.51	38.26	20.53	43.11	41.46	20.79	47.42	-12	-18	-21
Uttar Pradesh	63.36	33.13	79.16	52.41	28.31	65.88	45.56	22.70	50.61	52.31	29.06	57.48	44.45	23.93	52.44	-30	-28	-34
West Bengal	41.41	24.86	47.28	34.88	19.96	42.54	32.99	17.32	36.66	35.07	18.98	41.91	34.69	18.72	41.16	-16	-25	-13

A: Average of all classes. LD: Average of lowest three deciles (1,2, & 3). UD: Average of upper three deciles (7, 8 & 9).

average MPCE declined marginally in the period but the three lower and the upper deciles improved slightly, implying a decline of the middle deciles. The average MPCE in Orissa continued to decline till the late seventies only to improve slightly in 1983.

The average MPCE by deciles appeared to be converging in the mid sixties i.e. the distribution of average MPCE was less dispersed in the mid sixties than early sixties. It, however, diverged again in the late seventies. Convergence of average MPCE by deciles was associated more with decline in expenditures of the upper deciles, than with improvements of the lower deciles. Similarly divergence marks greater improvements in the case of the upper deciles than the lower deciles.

The increase in the average MPCE in the late seventies and early eighties was not enough to compensate for the losses suffered in the early sixties. The net result is a lower level of expenditure in 1983 as compared to 1961-62 for all the deciles in all the states except the lower deciles in Punjab. The order of decline varied between 1% to 12% for Andhra Pradesh, Maharashtra, Himachal Pradesh, and Kerala for the lower deciles. For other states the decline was between 25% to 39%. The MPCE of the upper deciles was reduced by 8 to 20% in Andhra Pradesh, Haryana, Himachal Pradesh, Kerala, Punjab & West Bengal. The maximum reduction in MPCE was in Kerala i.e. about 42%.

The average MPCE of the lower deciles ranged between Rs. 21-41 in 1961-62, Rs. 16-43 in 1970-71 and Rs. 19-44 in 1983. The ranges for upper deciles were Rs. 47-112, Rs. 35-98 and Rs. 38-101 respectively for the three periods.

The ranking of the states by the average MPCE levels is presented below:

Table 2.2

States	State Rankings by Average Monthly Per Capita Expenditure (Total)					
	Rural			Urban		
	1961-62	1970-71	1983	1961-62	1970-71	1983
Andhra Pradesh	10	9	8	14	12	14
Bihar	13	10	14	8	11	15
Gujarat	6	6	5	9	13	8
Madhya Pradesh	2	2	2	6	3	2
Himachal Pradesh	7	3	3	3	2	1
Karnataka	4	8	7	11	10	10
Kerala	15	14	10	15	15	7
Madhya Pradesh	12	15	15	10	7	9
Maharashtra	8	7	11	4	5	5
Orissa	11	12	12	7	8	11
Punjab	1	1	1	5	1	13
Rajasthan	3	4	4	1	4	4
Tamil Nadu	9	11	9	12	14	12
Uttar Pradesh	5	5	6	13	9	13
West Bengal	14	13	13	2	6	6

Note: States are ranked from high to low.

A marginal improvement or deterioration is noticed in the relative ranking of the states. By and large the relatively poorer states remained poor and the better off states stayed better off, as indicated by a very high and positive rank correlation equal to +0.9.

### B. Urban Areas

In urban areas the average MPCE range over the states was narrower than in the rural areas. In 1961-62 this range was Rs. 47 to Rs. 74 in Bihar. Maharashtra, Orissa, Punjab, Rajasthan and West Bengal enjoyed significantly higher levels of per capita expenditure around Rs. 70. This range broadened to Rs. 40 - 84 during the sixties implying divergence in the achieved rate of growth of these states. The average MPCE declined for all the states during 1961-62 to 1970-71 with the exception of Punjab. Punjab registered an increase from Rs. 71 to Rs. 83 in its average MPCE. The range further broadened to Rs. 38-84 in 1983. Kerala remained at the bottom of the range throughout. Himachal Pradesh appears to have performed best with the highest average MPCE.

The sharp decline in average MPCE in the sixties was arrested in the early seventies only in respect of five out of fifteen states viz; Gujarat, Maharashtra, Himachal Pradesh, Karnataka & Tamil Nadu. All states except Orissa, Rajasthan, and West Bengal registered a marginal improvement in the late seventies and early eighties. Gujarat, Karnataka and Tamil Nadu are the only states which showed improvement in the seventies in the rural as well as urban areas.

In the overall period from 1961-62 to 1983, Haryana, Himachal Pradesh and Punjab registered improvements of the order of 8 to 16%, whereas all other states had marked declines to the extent of 8 to 40%. The maximum decline was in Bihar (40%), followed by Orissa (28%). This steep decline over the two decades brought the two states down from a comfortable level of average MPCE over Rs. 70 to a low level of Rs. 42 and 50 respectively (Table 2.3).

The inter-temporal movement of average MPCE by deciles over states in urban areas resembles the corresponding characteristics in the rural areas. The level of average MPCE declined for every decile till the mid sixties, then stayed constant till the early seventies and increased slightly thereafter. Punjab, however, did not conform to this pattern. In this state, the lower deciles registered increases during 1961-62 to 1972-73. The upper deciles showed improvements only after 1968. All the deciles suffered reverses after 1973, unlike the rest of the states.

Average MPCE over the states varied between Rs. 21 and 41 in 1961-62. This range was maintained in 1983 as well. The difference, however, was that more states were nearer to Rs. 30 in 1961-62 and nearer to Rs. 25 in 1983. The range of upper deciles in urban areas was narrower than the corresponding range in rural areas in 1961-62. This range was Rs. 64 to 98. During the early sixties, ten states had slipped to a lower level of Rs. 47 or so.

Table 2.3

Inter-State Variations in Monthly Per Capita Expenditure on All Items  
(Rs.: At 1970-71 prices)

Region: Urban

States	1961-62			1966-67			1970-71			1977-78			1983			Percentage Change 1983 over 1961-62		
	A.	L.D.	U.D.	A.	L.D.	U.D.	A.	L.D.	U.D.	A.	L.D.	U.D.	A.	L.D.	U.D.	A.	L.D.	U.D.
Andhra Pradesh	49.74	28.71	64.00	43.85	24.06	52.55	47.38	24.49	53.41	50.11	26.27	57.56	47.62	24.36	56.01	-4	-15	-12
Bihar	70.72	33.24	88.38	43.97	24.11	56.30	47.24	25.22	56.30	42.51	22.79	47.77	42.29	22.75	47.69	-40	-32	-46
Gujarat	63.23	36.23	83.86	45.00	26.70	57.18	46.95	28.68	52.85	58.35	32.41	63.75	51.35	29.09	55.61	-19	-20	-34
Haryana	N.A.	N.A.	N.A.	66.76	32.90	78.86	65.34	35.21	85.99	74.99	37.75	87.59	77.73	39.04	97.05	+16	+19	+23
Himachal Pradesh	N.A.	N.A.	N.A.	77.95	37.57	94.51	74.69	36.13	96.56	83.25	37.21	87.13	83.89	36.07	86.81	+8	-4	-8
Karnataka	57.15	30.10	75.15	40.17	22.74	50.00	48.76	24.80	55.40	50.83	26.05	52.45	51.80	24.49	60.39	-9	-19	-22
Kerala	46.88	21.02	65.02	36.72	15.88	51.32	40.36	17.22	49.54	38.83	15.26	46.49	38.54	20.34	56.33	-18	-3	-13
Madhya Pradesh	62.87	37.29	89.86	55.00	27.37	63.20	56.60	27.73	62.80	56.04	27.19	58.67	52.98	28.47	60.30	-22	-24	-33
Maharashtra	71.28	40.22	93.38	59.89	31.79	75.05	62.67	33.21	79.67	64.81	32.50	70.06	59.13	26.90	63.14	-17	-33	-32
Orissa	70.40	29.47	94.86	51.73	26.43	65.68	53.28	26.65	63.81	47.32	23.33	55.30	50.31	24.83	49.58	-28	-16	-47
Punjab	70.86	33.16	98.28	69.43	39.94	99.93	83.41	42.16	101.93	82.10	36.71	80.93	75.55	37.31	83.36	+7	-11	-15
Rajasthan	73.79	44.33	93.78	58.01	33.71	76.04	64.44	32.94	76.14	63.69	34.67	71.20	61.59	31.16	68.44	-16	-30	-27
Tamil Nadu	54.40	27.56	64.49	40.65	21.14	49.06	42.16	21.23	48.26	42.60	21.47	49.28	50.07	23.29	55.65	-8	-15	-14
Uttar Pradesh	54.29	27.19	68.67	52.15	27.16	61.11	49.64	25.27	57.49	55.74	29.14	61.88	48.38	25.12	55.36	-11	-8	-19
West Bengal	72.10	37.01	88.92	56.18	30.04	72.67	57.99	28.71	69.22	52.59	25.79	59.81	52.73	25.63	59.20	-27	-31	-33

A: Average of all classes., LD: Average of lowest three deciles (1, 2, & 3)., UD: Average of upper three deciles (7, 8 & 9).

The overall decline of average MPCE for the lower deciles was between 3 to 33%; the least decline was in Kerala and the maximum in Bihar, Maharashtra, and Rajasthan. The corresponding decline for upper deciles was 8 to 47%; the least for Himachal Pradesh and the maximum for Bihar and Orissa. Ranking of the states over time by average MPCE was less consistent in urban areas than rural areas. Kerala, Gujarat, Uttar Pradesh, West Bengal, and Bihar changed their relative position strikingly. Rank correlation here comes out to 0.9 (Table 2.2).

It is interesting to note that in certain states, the level of MPCE in rural and urban areas is diametrically opposite. West Bengal's rural areas have a very poor rank of 13, but urban areas are quite well off (rank 6). Uttar Pradesh is just the reverse of West Bengal. Similarly Karnataka and Gujarat rural areas are better off than their counterpart urban areas. The rank correlation between rural and urban ranking is close to zero.

### III. Consumer Expenditure : Food

#### A. Rural Areas

This section deals with monthly per capita expenditure on food. In rural areas the average expenditure on food in 1961-62 was Rs. 26 in Kerala, Rs. 53 in Rajasthan and Rs. 60 in Punjab. In other states, expenditure on food was between Rs. 30 to Rs. 45. In 1983 this range was Rs. 25 (Bihar) to Rs. 53 (Punjab).

The expenditure on food was between 60-70% of total expenditure throughout the period in almost all the states. The time series of per capita food expenditure and per capita total expenditure are similar to each other. The rate of decline in food expenditure, of the order of 7% to 35%, is quite close to the rate of decline of 2% to 35% in total expenditure. Himachal Pradesh and Kerala registered marginal increases in average per capita food expenditure of 2% & 7% respectively as in total expenditure (Table 2.4).

Per capita expenditure on food declined in the sixties for all states except Punjab. The decline was steeper in Gujarat, Karnataka, Madhya Pradesh, Rajasthan, and Uttar Pradesh than in other states. In Andhra Pradesh, Gujarat, Karnataka, Maharashtra, Rajasthan, and Uttar Pradesh the food expenditure improved during 1971-78 but declined again almost to the level of 71 in 1983. Madhya Pradesh and Orissa experienced a continued decline till 1978, with marginal improvement in 1983. Kerala, Tamil Nadu, and West Bengal improved in food expenditure during 1974-83. Bihar and Haryana faced a continuous decline in the entire period. Punjab improved in food expenditure during 1961-71 and experienced set backs in the later period.

The food expenditure of the lowest deciles declined in the period 1961-73 in all states. In Kerala, the lowest 10% of the consumers marked marginal improvement and in West Bengal all the deciles improved during 1974-83. In Tamil Nadu the food consumption of the lowest deciles went down despite improvement in average food consumption in the state. The upper deciles consequently gained in Tamil Nadu, leading to a greater divergence in food consumption during 1974-83. In Haryana and Punjab, food consumption declined

Table 2.4

Inter-State Variations in Monthly Per Capita Expenditure on Food  
(Rs.: At 1970-71 prices)

Region: Rural

States	1961-62			1966-67			1970-71			1977-78			1983			Percentage Change 1983 over 1961-62		
	A.	L.D.	U.D.	A.	L.D.	U.D.	A.	L.D.	U.D.									
Andhra Pradesh	31.57	20.57	40.70	26.40	19.42	35.68	27.51	17.77	31.90	29.78	19.98	34.85	27.30	17.72	32.43	-14	-14	-20
Bihar	31.15	23.92	46.45	30.24	17.36	40.97	27.07	16.85	31.93	26.85	16.72	32.48	25.39	15.58	30.49	-23	-35	-34
Gujarat	44.26	33.02	52.67	30.90	19.20	40.72	32.02	19.70	36.96	35.54	23.88	42.56	32.57	21.44	37.35	-26	-35	-29
Haryana	N.A.	N.A.	N.A.	53.42	33.31	66.50	50.77	29.87	58.55	47.38	28.65	59.71	46.68	28.37	56.69	-2	-12	-2
Himachal Pradesh	N.A.	N.A.	N.A.	38.61	29.07	51.18	39.84	28.16	46.23	39.57	26.91	44.60	39.48	25.02	43.01	+2	-14	-16
Karnataka	44.25	28.28	54.98	30.02	18.51	38.60	28.44	17.37	31.42	30.42	18.27	33.50	28.78	16.73	31.00	-35	-41	-44
Kerala	25.73	16.35	35.04	18.82	12.22	24.72	22.05	12.36	24.94	24.87	13.54	30.59	27.49	16.01	33.49	+7	-2	-4
Madhya Pradesh	43.12	28.58	54.12	32.89	20.13	41.48	28.29	16.85	31.55	23.16	15.03	27.20	28.11	17.32	33.27	-35	-39	-4
Maharashtra	34.28	24.13	46.83	27.95	19.09	34.96	28.45	19.56	32.18	30.17	20.47	34.96	27.25	17.59	31.25	-22	-27	-33
Orissa	32.21	18.92	40.71	29.53	18.58	36.51	25.92	14.04	29.32	24.53	14.53	29.74	29.86	17.57	35.62	-7	-7	-12
Punjab	60.17	32.46	73.37	55.60	33.72	69.41	58.73	33.60	67.00	56.19	33.05	71.45	52.77	32.55	65.24	-12	0	-11
Rajasthan	53.06	31.17	66.46	45.60	27.59	53.79	34.78	19.18	42.12	46.46	27.03	56.56	37.83	21.24	44.05	-29	-32	-34
Tamil Nadu	33.52	20.26	43.18	29.12	18.09	35.78	25.27	15.19	29.32	26.63	16.66	31.57	28.97	16.45	34.42	-14	-19	-20
Uttar Pradesh	42.38	27.15	51.12	40.01	24.03	49.48	32.40	18.67	37.89	36.46	23.29	40.15	30.34	18.50	35.81	-28	-68	-28
West Bengal	31.31	21.48	36.87	28.17	17.27	34.56	26.40	14.91	30.02	26.70	16.04	32.14	27.06	15.71	32.13	-14	-27	-13

A: Average of all classes., LD: Average of lowest three deciles (1, 2, & 3)., UD: Average of upper three deciles (7, 8 & 9).

in 1974-83 for all the deciles. In other states there was no consistent pattern in the food consumption of deciles during 1974-83.

The overall decline (1961-83) in food consumption of the lower deciles was greater than the average of all deciles in all the states except Punjab, ranging between 2 to 68%. Food expenditure of the poor varied between Rs. 16-33 in 1961-62, Rs. 12-34 in 1970-71 and Rs. 16-33 in 1983 over all the states. In 1961-62, the poor of thirteen out of fifteen states spent over Rs. 20 on food, whereas in 1983 the number of such states declined to five.

The upper deciles, in the states studied suffered a reduction in food expenditure, but to a lesser degree than the lowest deciles. In Madhya Pradesh it was 4% as compared to 39% for the lower deciles and in Uttar Pradesh it was 25% as against 68% for the lower deciles. In Punjab, Karnataka and Maharashtra the upper deciles' drop in food expenditure was less than that of the lower deciles. The food expenditure of the upper deciles ranged between Rs. 35-73, Rs. 25-67 and Rs. 30-65 in 1961-62, 1970-71 and 1983 respectively. Punjab consistently enjoyed the best standards. Kerala moved upward from the lowest to the tenth position. The proportion of expenditure spent on food was the same for the lower and upper deciles in the sixties but later this proportion declined for the rich.

#### B. Urban Areas

In urban areas, the inter-state variations in levels of food consumption were less pronounced than in the rural areas. The ranges of average expenditure on food were Rs. 31-49, Rs. 25-51 and Rs. 29-49 in 1961-62, 1970-71 and 1983 respectively. The percentage decline varied from 7% to 26% during 1961-62 to 1983. Haryana registered an increase of 26% and Himachal Pradesh of 5% (Table 2.5).

In the sixties, food consumption declined for all the states except Punjab, Haryana and Himachal Pradesh which registered marginal improvements. Nine out of fifteen states improved during 1978 but receded in 1983. Orissa and Rajasthan deteriorated in 1977-78 and improved in 1983. Food consumption increased continuously during 1961-83 in Haryana and Tamil Nadu and declined in Madhya Pradesh (Table 2.5).

Food consumption of the urban poor was about 50% of the urban rich. The ranges of food expenditure of the lower deciles were Rs. 16-35, Rs. 13-25 and Rs. 15-27 during 1961-62, 1970-71 and 1983. The level of food consumption of the urban poor is lower than that of the rural poor.

The rate of change in food consumption of the lower deciles during 1961-83 was +2 to -32% over the states, and that of the upper deciles was +16 to -39%. Consumption of food declined for all the deciles during 1961-71 in all the states. It improved in all states except Bihar, Haryana, Kerala, Madhya Pradesh, Tamil Nadu and West Bengal during 1974-83. In Punjab the improvement was only in respect of the lowest decile. In Karnataka and Orissa distribution of food went in favour of the lower deciles and against the upper deciles.

Table 2.5

Inter-State Variations in Monthly Per Capita Expenditure on Food  
(Rs. At 1970-71 Prices)

Region: Urban

States	1961-62			1966-67			1970-71			1977-78			1983			Percentage Change 1983 over 1961-62		
	A.	L.D.	U.D.	A.	L.D.	U.D.	A.	L.D.	U.D.									
Andhra Pradesh	32.61	22.36	41.76	28.37	18.44	33.83	30.18	19.24	33.31	31.79	20.65	37.14	29.37	18.49	33.37	-10	-17	-20
Bihar	40.34	26.43	56.15	31.11	19.74	40.95	32.29	20.62	39.06	31.05	18.92	35.10	30.13	18.72	34.70	-25	-29	-38
Gujarat	40.75	27.81	54.51	30.44	20.95	39.31	32.09	22.43	38.46	37.12	25.29	42.10	34.28	22.00	37.00	-16	-20	-32
Haryana	N.A.	N.A.	N.A.	24.73	50.89	45.28	26.62	55.17	47.92	28.39	58.16	48.55	28.33	58.53	+26	+21	+16	
Himachal Pradesh	N.A.	N.A.	N.A.	47.56	25.57	54.81	45.40	23.91	56.41	73.75	29.76	55.90	49.93	25.91	49.63	+5	1	-9
Karnataka	38.32	23.54	51.82	27.67	17.79	34.74	32.08	18.96	36.22	33.34	20.11	35.11	32.82	18.35	36.81	-14	-22	-29
Kerala	31.19	16.41	42.65	22.74	12.31	33.45	25.57	12.96	30.92	25.53	11.76	30.98	31.34	15.46	35.14	0.5	-6	-18
Madhya Pradesh	41.45	27.56	53.68	35.77	21.25	42.41	35.89	21.06	38.84	34.81	21.55	40.22	34.69	21.53	39.91	-16	-22	-26
Maharashtra	40.70	28.92	54.93	35.94	21.98	44.31	38.44	24.19	45.10	39.15	24.06	44.89	37.49	19.81	38.68	-8	-32	-30
Orissa	41.34	22.73	59.08	35.52	21.11	43.35	37.01	21.41	44.05	33.08	18.93	39.82	35.27	20.15	35.95	-15	-11	-39
Punjab	43.94	25.95	60.64	46.59	30.31	62.79	50.92	30.39	61.12	48.32	27.98	53.11	46.20	27.48	49.54	+5	6	-18
Rajasthan	49.17	35.15	62.13	39.07	26.79	48.19	40.82	25.94	48.42	41.45	26.35	45.93	38.71	23.14	42.34	-21	-34	-32
Tamil Nadu	34.81	21.53	42.46	27.41	16.40	32.56	27.58	16.35	30.53	27.68	16.63	32.32	31.88	19.03	36.34	-8	-16	-14
Uttar Pradesh	33.63	20.80	42.72	34.26	21.14	41.82	32.41	19.64	36.29	37.02	22.80	41.88	31.35	19.04	36.07	-7	-8	-16
West Bengal	43.92	28.28	54.95	36.84	23.46	46.19	38.49	22.44	44.46	35.46	20.42	40.48	34.77	19.89	39.51	-21	-30	-28

A: Average of all classes., LD: Average of lowest three deciles (1,2, & 3)., UD: Average of upper three deciles (7, 8 & 9).

#### IV. Consumer Expenditure: Foodgrains, Cereals, Pulses and Milk

##### A. Rural Areas

(Analysis in this section is based on figures 1, 4, and 6 of the state profiles which are available in separate reports).

Foodgrains, in rural areas, constituted the major part of total food consumption, i.e. about 60%. In Haryana, Himachal Pradesh, Gujarat, Punjab, and Rajasthan, due to a higher level of milk consumption, the proportion spent on foodgrains was about 30-40% of total expenditure. The proportion of foodgrain expenditure spent on cereals was over 90% in all the states.

Foodgrain expenditure followed the pattern of total food expenditure. Expenditure on foodgrains declined during 1962-83 for most states. The periods of increases were 1968-78 in Andhra Pradesh, 1974-78 in Bihar, 1967-69 in Haryana and 1968-83 in Kerala. These improvements were marginal and not enough to offset the decline in the earlier period.

Expenditure on pulses, for all the states, showed a marginal decline in the sixties and early seventies, and a marginal improvement thereafter with a net decline throughout the period.

In the rice consuming states i.e. Andhra Pradesh, Bihar, Kerala, Tamil Nadu, Orissa & West Bengal, the consumption of rice declined in the period 1962-74. In Orissa and West Bengal it continued to decline even later whereas in other states partial recovery was achieved. Wheat consumption in these states increased during 1962-73 except in Andhra Pradesh and Tamil Nadu where it continued to be negligible, near zero. In Andhra Pradesh, the decline in rice consumption was partially offset by increased consumption of coarse grains which was about one third the quantity of rice consumption.

The major wheat consuming states are Haryana, Punjab and Uttar Pradesh. In Haryana and Uttar Pradesh, consumption of wheat increased at the expense of rice and coarse grains. In Punjab consumption of all the grains declined during the study period.

In the states where coarse grains constitute a substantial proportion of foodgrain consumption, i.e. Rajasthan, Maharashtra, Kerala, and Gujarat, consumption of wheat increased during 1962-74, and that of rice and coarse grains declined. In Karnataka, rice was substituted by wheat and coarse grains. In nearly all the states the poor consumed over 2 times the coarse grains consumed by the rich.

Milk consumption in rural areas continued at a low level of Rs. 1 to 2 per month per person for ten out of fifteen states. It was around Rs. 20 in Punjab and Haryana, and around Rs. 9 in Gujarat, Himachal Pradesh and Rajasthan. Expenditure on milk declined in all states during the sixties and increased marginally during the seventies. It increased steadily during the sixties and seventies in Andhra Pradesh and Rajasthan and remained constant in Punjab.

The decline in expenditure on foodgrains is fairly distributed over all the deciles in all the states. The decline, however, has been slightly sharper for the upper deciles than the lower deciles, leading to a narrowing of the gap between the consumption of foodgrains of upper and lower deciles.

#### B. Consumer Expenditure: Cereals; Comparative Estimates

A recent study undertaken by Bhattacharya et. al. (1986) has brought out estimates of per capita monthly expenditure on cereals at 1960-61 prices for six states viz., Bihar, Haryana, Kerala, Punjab, Tamil Nadu and West Bengal. These estimates along with the corresponding estimates of the current study are presented in Table 2.6. The NSSO reported quantities of cereals for rounds 27, 28 and 32 and the estimated quantities as per the current study are also presented. A few highlights are (i) The estimates of Bhattacharya et. al. are only up to the 28th round i.e. 1973-74, (ii) The monthly per capita expenditure on cereals estimated by Bhattacharya et. al. and others at 1960-61 prices for the six states viz., Bihar, Haryana, Kerala, Punjab, Tamil Nadu and West Bengal are not comparable with each other as they are at different state prices in 1960-61. The actual prices in that year not being mentioned in the report, the quantity estimates of cereals consumed are not derivable. (iii) Comparing the change in the expenditure estimates of cereal consumption at constant prices as given by Bhattacharya et. al. with the change in the reported quantity estimates in rounds 27 and 28, a reverse movement is observed in the case of Bihar, Tamil Nadu and West Bengal. Instead of evident declining consumption of cereal, the estimates project an increase. This does cast some doubt on the estimates.

The estimates of the current study, however, are free from these limitations. The cereal consumption estimates in rupees at 1970-71 prices are comparable over all the states as the formulated deflators are adjusted for the inter-state price differences. The quantities are derivable from the expenditure estimates with a simple division by Rs. 1.14 per kg. in 1970-71. The estimated quantities in round 27, 28 and 32 as shown in Table 2.6 almost replicate the reported quantities. The proximity of estimates in these round is a pointer to the accuracy of the estimates in other rounds.

#### C. Urban Areas

(Analysis in this section is based on Figures 11, 14, and 16 of the state profiles which are available in separate reports)

In urban areas the expenditure on foodgrains formed a smaller proportion of total food, about 40-50% in low milk consuming states and 30% in high milk consuming states.

Foodgrain consumption, generally declined in the early sixties and improved slightly in the late sixties except in Haryana where it steadily increased during the entire period. During the seventies and early eighties, expenditure on foodgrains was fairly constant in most states. It declined during 1974-83 in Madhya Pradesh, Orissa and Tamil Nadu. The composition of foodgrains, however, underwent change. Consumption of rice declined in 1962-73 except in Punjab and improved during 1974-78 except in Bihar, Gujarat, Haryana, Himachal Pradesh, Orissa, Rajasthan, and Tamil Nadu. Rice was

Table 2.6

Comparative Estimates of Per Capita Monthly Cereal Consumption by States

Region: Rural

Rounds	Estimates of Bhattacharya at 1960-61 prices (Rs.)						Estimates of this Study at 1970-71 Prices. (Rs.)					
	Bihar	Haryana	Kerala	Punjab	T. Nadu	W Bengal	Bihar	Haryana	Kerala	Punjab	T. Nadu	W. Bengal
20	8.75	7.44	4.75	6.03	7.47	7.10	23.38	18.33	8.21	17.76	16.74	18.56
21	6.69	7.63	5.09	6.07	7.03	6.94	19.63	22.63	7.95	20.84	16.95	17.94
22	6.78	6.52	5.68	5.29	7.46	6.76	18.12	17.91	7.96	15.63	14.47	18.74
23	8.04	8.02	4.70	6.22	7.16	6.87	16.13	20.10	8.47	19.28	15.44	15.79
24	8.23	7.14	4.52	5.25	6.70	7.74	17.80	20.20	7.74	17.20	15.16	16.56
25	7.92	7.15	4.79	5.67	7.76	7.45	17.60	19.90	9.12	17.31	14.64	16.71
27	7.93	7.45	5.84	5.19	8.60	8.17	17.55	19.90	9.03	17.41	16.51	15.54
28	8.19	6.44	5.27	5.12	8.52	8.59	16.94	18.55	8.68	16.86	16.79	14.71
32	-	-	-	-	-	-	18.15	17.43	10.34	16.14	15.72	16.73
38	-	-	-	-	-	-	17.94	14.97	11.78	14.12	17.00	17.99
	N.S.S.	Reported	Quantity	Estimates (kgs.)			Quantity	Estimates of this study (kgs.)				
27	15.58	17.57	7.97	15.38	14.53	13.64	15.39	17.46	7.92	15.27	14.48	13.63
28	14.99	16.56	7.68	14.89	14.72	12.97	14.86	16.27	7.61	14.79	14.73	12.90
32	16.16	15.22	9.18	14.35	13.85	14.74	15.92	15.28	9.07	14.16	13.79	14.68

Source : 'Relative Price of Food and the Rural Poor - The case of India' by N. Bhattacharya, D. Coondoo, P. Maiti and R. Mukherjee; report prepared by Indian Statistical Institute for International Labor Organisation, Geneva, 1986..

substituted by wheat, in general, except in Andhra Pradesh, Madhya Pradesh, Punjab, Rajasthan, and Tamil Nadu. In Punjab the substitution was in favor of rice and away from wheat. In Andhra Pradesh wheat consumption continued to be negligible. In Tamil Nadu rice was substituted by coarse grains.

Consumption of coarse grains was almost nil in eight out of fifteen states. Low consumption of coarse grains in urban areas further declined in this period. It increased only in Tamil Nadu during 1962-74.

Consumption of pulses declined in the early sixties, increased partially in the late sixties, and stayed nearly constant thereafter.

Consumption of milk generally declined in the early sixties and increased in the late seventies and early eighties. In Haryana and Himachal Pradesh it increased during the entire period. High milk consumption states are Haryana, Punjab, Rajasthan, and Himachal Pradesh. States with moderate milk consumption are Karnataka, Madhya Pradesh, and Maharashtra.

Foodgrain consumption of many upper deciles was close to each other indicating that foodgrain consumption did not increase consistently with increase in total expenditure. In certain cases like urban Maharashtra, the 9th decile's expenditure on foodgrains is the least. This phenomenon is present only in the urban areas. This feature is peculiar to foodgrains only and not to food expenditure, implying thereby substitution of other items of food for foodgrains according to taste, availability and income. The phenomenon is in conformity with the famous Engel's Law which shows a smaller proportion of income spent on food as income rises (Mellar 1966). A study of 85 countries (FAO/WHO, 1971) also showed that the proportion of cereals in the diet varied with income and the proportion of energy derived from fats rose steeply with income.

### CHAPTER 3

#### ANALYSIS OF NUTRITIONAL ADEQUACY: ENERGY AND PROTEIN

Energy and protein intakes presented in this chapter have been calculated from the estimates of quantities of food items consumed, derived in turn from real expenditures on these items.

#### 1. Rural Areas

##### A. Average Consumption of Energy and Protein

In the rural areas the average daily per capita estimated intake of calories varied significantly between the states in 1961-62. The lowest energy intake was in Kerala (1400 kcal.) and the highest was in Rajasthan (3400 kcal.). In all the states, other than Kerala, calorie consumption on the average was above 2,150 kcal, the energy norm recommended for Indians by ICMR. Poverty which existed in these states was more a matter of inequitable distribution. (Figure 3.1). Protein consumption on the average was more adequate than energy consumption, and was sufficiently higher than the daily per capita norm of 45.2 gms. recommended for Indians by ICMR. Kerala was the only protein deficient state; the deficiency though was quite marginal (Figure 3.2). Average protein intake in other states was over 60 gms. per day. In Punjab and Rajasthan it was over 90 gms. per day.

In 1983, the scenario changed to a gloomy picture of widespread shortages in daily consumption compared to requirements. Only in five states viz. Haryana, Himachal Pradesh, Orissa, Punjab and Rajasthan was the average calorie intake over 2,150 kcal. Even in these states average calorie consumption declined substantially during 1961-83, e.g., from 3,400 to 2,200 kcal in Rajasthan and from 3,300 to 2,600 kcal in Punjab. In states other than Kerala, the average calorie consumption was between 1600 and 1900 kcal. In Kerala the level was only 1,350 kcal. However, a different pattern emerges for protein adequacy with the ICMR norm of 45.2 gms. generally satisfied in all states in 1983 except in Kerala.

##### B. Consumption of Energy and Protein by Deciles

The distribution of calories was, however, quite uneven generating a significantly large proportion of the population below the poverty line in many states. In 1961-62 the average calorie intake of the three lowest deciles was below 2,150 in all the states, though Rajasthan was quite close to it. Mean energy consumption varied between 960 kcal (Kerala) and 2,141 kcal (Rajasthan). For most of the states the level was around 1,500 kcal. In 1983 the calorie intake levels of the three lowest deciles declined in all the states pushing the range to 839 kcal (Kerala) and 1,572 kcal (Haryana). The modal value also slipped down to 1,200 kcal. per person per day (Table 3.1).

The calorie intake of the lowest decile, throughout the study period, was around 1,100 kcal in most of the states. In Kerala it was half this level (500 kcal) and in Haryana, Himachal Pradesh, Punjab and Rajasthan the calorie intake of the lowest decile was about 1,300 kcal.

# PER CAPITA ENERGY INTAKE

BY STATES IN RURAL AREA

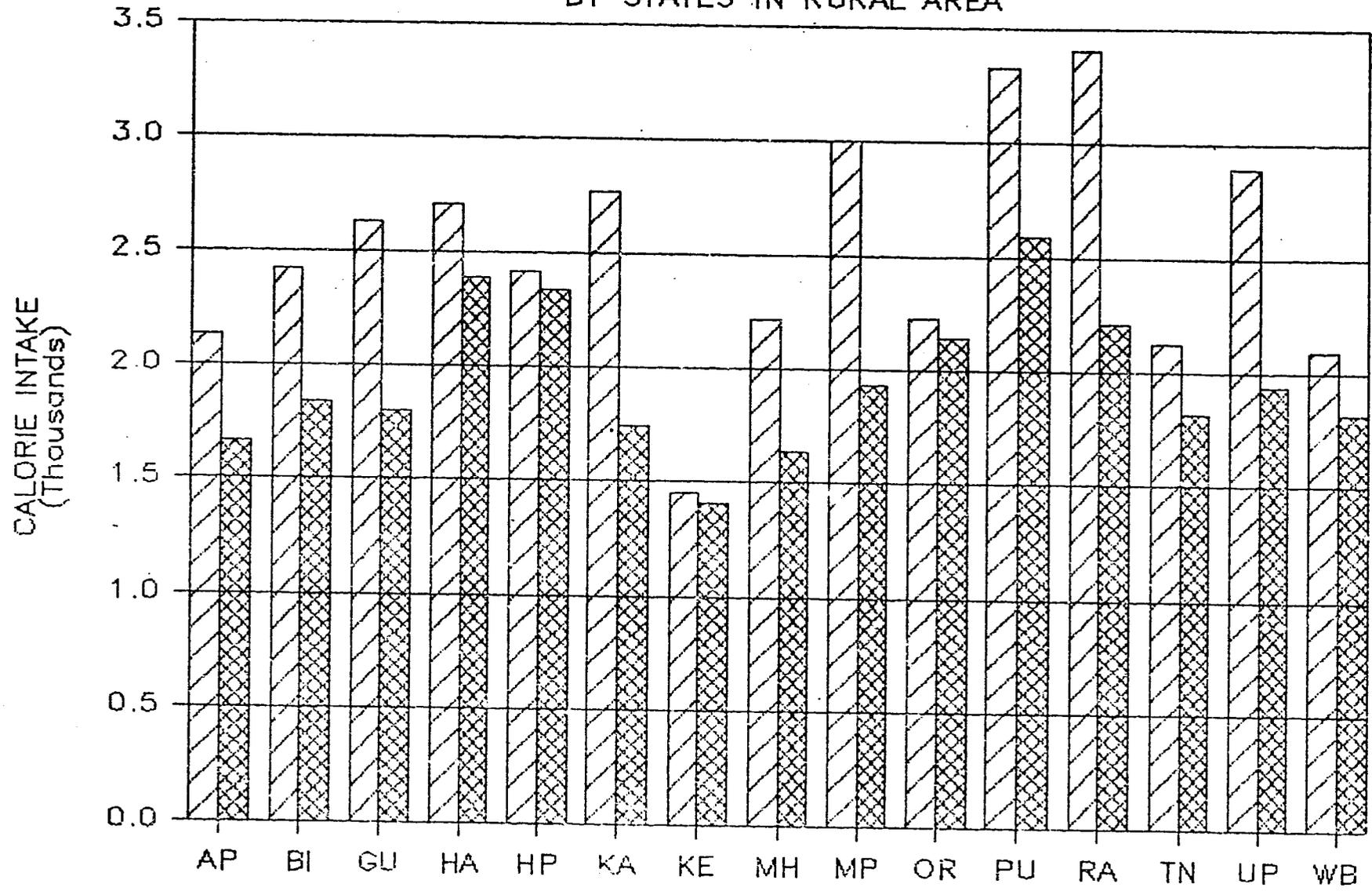


FIG. 3.1

CALORIE INTAKE  
(Thousands)

STATES



1961-62

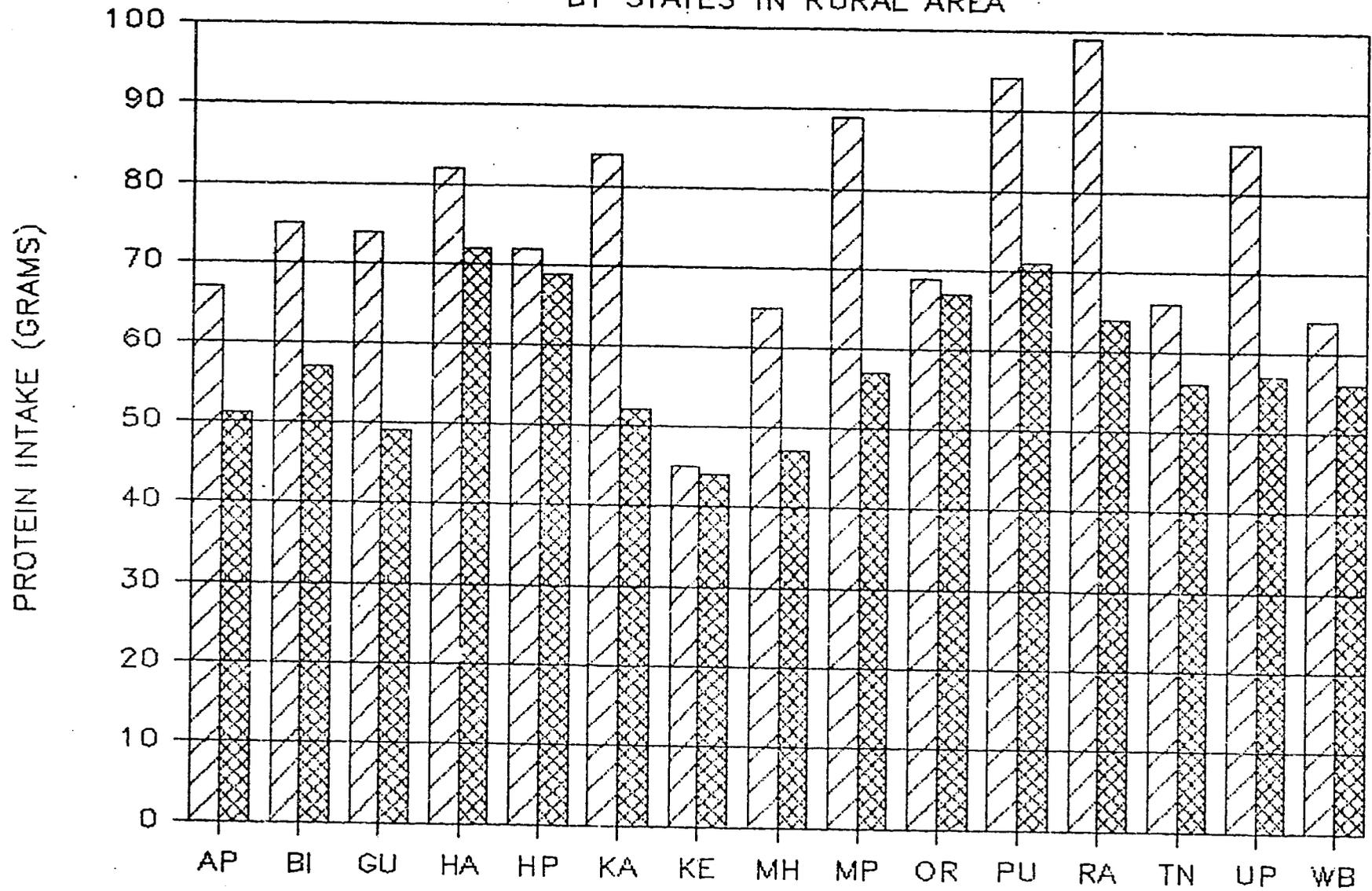


1983

HA, HP: 1966-67

# PER CAPITA PROTEIN INTAKE

BY STATES IN RURAL AREA



PROTEIN INTAKE (GRAMS)

AP BI GU HA HP KA KE MH MP OR PU RA TN UP WB

STATES



1961-62



1983

HA, HP: 1966-67

Table 3.1

Inter-State Variations in Calorie Intake Per Day Per Person (kcal)

Region: Rural

States	1961-62		1966-67		1970-71		1977-78		1983		Percentage Change 1983 over 1961-62	
	L.D.	U.D.	L.D.	U.D.	L.D.	U.D.	L.D.	U.D.	L.D.	U.D.	L.D.	U.D.
Andhra Pradesh	1535	2714	1275	2146	1235	2042	1382	2148	1192	1947	-22	-28
Bihar	1861	3342	1288	2979	1321	2343	1284	2325	1209	2194	-35	-34
Gujarat	2171	3035	1479	2395	1275	2136	1564	2431	1261	2042	-42	-33
Haryana	N.A.	N.A.	2132	3834	1849	3211	1740	3131	1621	2843	-24	-26
Himachal Pradesh	N.A.	N.A.	1956	3116	1860	2791	1820	2626	1644	2545	-16	-18
Karnataka	1907	3450	1244	2449	1196	1976	1220	2068	1093	1847	-43	-46
Kerala	1012	1979	691	1295	745	1342	765	1553	920	1679	-9	-15
Madhya Pradesh	2203	3705	1460	2830	1295	2158	1159	1849	1315	2220	-40	-40
Maharashtra	1685	2949	1210	2116	1316	1947	1383	2155	1150	1853	-32	-37
Orissa	1452	2794	1358	2539	1085	2096	1127	2142	1386	2537	-5	-9
Punjab	2116	3799	2088	8762	1890	3218	1819	3517	1749	3116	-17	-18
Rajasthan	2307	4217	1852	3245	1355	2384	1782	3207	1450	2461	-37	-42
Tamil Nadu	1458	2637	1175	2209	1032	1839	1154	1957	1128	2145	-23	-19
Uttar Pradesh	2046	3356	1760	2383	1380	2488	1699	2538	1327	2227	-35	-34
West Bengal	1611	2401	1195	2285	1091	2039	1172	2073	1151	2131	-29	-11

LD: Average of lowest three deciles (1, 2, & 3)., UD: Average of upper three deciles (7, 8 & 9).

As against this, the average calorie intake of the upper deciles in 1961-62 reached 2,800 kcal which is the suggested ICMR norm after giving allowance for loss of calories in the process of food storage, processing, and cooking. Seven states, viz. Bihar, Gujarat, Karnataka, Madhya Pradesh, Orissa, Punjab (including Haryana and Himachal Pradesh) and Rajasthan almost satisfied this norm. The only state where even the upper deciles could not satisfy the 2,150 per capita calorie norm was Kerala.

In 1983, the picture changed to that of shortages even for the upper deciles. This reduction was quite consistent over the years except a slight uptrend during 1974-78. In five states out of the nine well-off states of 1961-62, viz. Haryana, Himachal Pradesh, Madhya Pradesh, Orissa and Punjab calorie intake was higher than 2,150 kcal. It, however, no longer reached 2,850 kcal. The calorie intake of the upper deciles was lowest in Kerala at 1,490 kcal and highest in Haryana at 2,585 kcal.

Distribution of protein intake between the different expenditure classes in 1961-62 was equally uneven. The average protein intake of the lower deciles was over the ICMR recommended minimum of 45.2 gms. per day in all the states, except Kerala, despite a large variation over the deciles. In Kerala protein intake was 32 gms. per day (Table 3.2). The lowest decile, throughout the period, consumed about 30 gms. of protein per day in all the states except Kerala where this level was 18 gms. per day. The average protein consumption of the upper deciles was above the required ICMR minimum in all states.

In 1983, however, only in Punjab and Haryana was the average protein intake of the lowest three deciles above the ICMR minimum requirement. The range of protein intake for the lower deciles was 28-48 gms. per day. The range for the upper deciles was 53-86 gms. per day. The percentage of decline in protein intake from 1961-83 was as much as 40% in both lower and upper deciles.

### C. Percentage of the Population below ICMR Norms on Energy and Protein Intake

In 1961-62 in rural areas there were wide inter-state variations in the percentage of persons who could not attain the minimum calorie requirement of 2,150 per day. It varied from a low of 10% in Gujarat, Madhya Pradesh and Rajasthan to 80% in Kerala. In West Bengal and Orissa this percentage was 50%, Andhra Pradesh and Tamil Nadu 40%, Karnataka 30% and the others 20% (Table 3.4).

In Kerala 40% of the population did not consume the required amount of protein i.e. 45.2 gms. 10% were protein deficient in Bihar, Maharashtra, Orissa and Tamil Nadu. In other states, this percentage was nil.

Protein deficiency may result despite seemingly sufficient protein intake on two grounds (i) calorie deficiency leads to conversion of protein into energy and thereby makes it unavailable as protein for the body's requirement, resulting in protein deficiency, (ii) the ratio of pulse protein to cereal protein should be at least 25% (ICMR) to produce a complementary balance of essential amino acids, the required level necessary for assimilation of protein since cereal protein is incomplete and lacks adequate levels of certain essential amino acids in which pulses are rich; the absence of any essential amino acid in the diet leads to cereal protein being used as energy and not as protein which leads to protein deficiency.

Table 3.2

Inter-State Variations in Protein Intake Per Day Per Person (gms.)

Region: Rural

States	1961-62		1966-67		1970-71		1977-78		1983		Percentage Change 1983 over 1961-62	
	L.D.	U.D.	L.D.	U.D.	L.D.	U.D.	L.D.	U.D.	L.D.	U.D.	L.D.	U.D.
Andhra Pradesh	48	85	39	65	38	64	43	67	37	59	-23	-31
Bihar	58	104	40	93	42	73	40	72	37	68	-36	-35
Gujarat	63	84	34	65	35	58	46	67	35	55	-44	-34
Haryana	N.A.	N.A.	64	116	56	97	53	97	48	86	-25	-26
Himachal Pradesh	N.A.	N.A.	58	94	55	81	54	78	43	75	-17	-20
Karnataka	59	105	38	74	37	60	37	62	33	56	-44	-47
Kerala	32	61	21	40	23	42	24	49	28	53	-13	-13
Madhya Pradesh	68	110	45	85	40	65	35	55	40	66	-41	-40
Maharashtra	51	87	35	61	39	57	41	63	33	53	-35	-39
Orissa	45	87	43	79	34	66	36	67	44	79	-2	-9
Punjab	62	108	58	109	53	91	50	101	47	87	-24	-19
Rajasthan	71	124	56	97	41	71	54	96	43	72	-39	-42
Tamil Nadu	45	80	36	68	32	57	36	60	35	66	-22	-18
Uttar Pradesh	62	100	54	101	41	75	51	75	40	66	-35	-34
West Bengal	50	74	37	70	34	63	36	64	36	66	-28	-11

LD: Average of lowest three deciles (1,2, & 3)., UD: Average of upper three deciles (7, 8 & 9).

Table 3.3

Inter-State Variations in Percentage of People Below ICMR Recommended Intake of Calories, Protein & Ratio of Cereal Protein to Pulse Protein\*

Region: Rural

States	1961-62			1966-67			1970-71			1977-78			1983			Percentage Change		
	Cal.	Pro.	CP:PP	1983 over														
	<u>2150</u>	<u>45.2</u>	<u>4:1</u>	1961-62														
Andhra Pradesh	40	10	90	80	20	100	80	30	100	80	10	100	90	40	100	50	30	+10
Bihar	20	10	80	40	20	100	60	20	90	60	20	100	60	20	100	40	10	20
Gujarat	10	0	20	70	40	90	70	30	70	50	10	70	80	40	40	70	40	20
Haryana	N.A.	N.A.	N.A.	20	0	100	20	10	70	30	10	100	50	10	100	30	10	0
Himachal Pradesh	N.A.	N.A.	N.A.	20	0	100	30	10	80	40	0	90	50	0	90	30	0	-10
Karnataka	20	0	70	60	20	100	80	0	100	90	30	100	80	40	100	60	40	30
Kerala	80	40	90	100	80	100	100	80	100	100	70	100	90	60	100	10	20	10
Madhya Pradesh	10	0	40	50	10	90	70	20	90	90	40	90	70	20	80	60	20	40
Maharashtra	30	10	0	80	30	80	90	30	90	80	20	90	90	50	70	60	40	70
Orissa	50	10	100	60	20	100	80	0	100	70	30	100	50	20	100	0	10	0
Punjab	20	0	90	20	0	100	20	10	80	20	10	80	30	10	80	10	10	-10
Rajasthan	10	0	90	20	10	100	60	20	100	30	10	100	50	10	100	40	10	10
Tamil Nadu	40	10	70	70	30	100	70	40	100	80	30	100	80	30	100	40	20	30
Uttar Pradesh	20	0	0	30	10	100	60	20	60	40	10	50	70	20	80	50	20	80
West Bengal	50	10	100	70	30	100	80	40	100	80	30	100	80	30	100	30	20	0

\* Foot Note: ICMR: Recommended Daily Intakes:, Cal = Calories 2,150 kcal, Pro = Protein 45.2 gms., and CP:PP = Cereal Protein to Pulse Protein less than 4:1

Besides calorie deficiency, as mentioned above, 70% of the persons in most states were not consuming enough pulse protein. In Karnataka and Uttar Pradesh, consumption of pulse protein was adequate in 1961-62 across all expenditure classes. In Gujarat pulse protein consumption was inadequate in 20% of the population and in other states 70% of the population.

In 1983, the percentage of persons not consuming the recommended calorie levels increased to 90% in some states viz; Andhra Pradesh, Kerala and Madhya Pradesh. It was over 30% in Punjab and over 50% in other states. The percentage of persons with inadequate protein intake increased to 40% in Andhra Pradesh, Gujarat, Karnataka, Kerala and Madhya Pradesh. It was about 10-30% in other states and nil in Haryana. The pulse to cereal protein ratio was inadequate in most groups in most states. 30% to 50% of the population in Gujarat, Madhya Pradesh, and Uttar Pradesh however, was inadequate with respect to this ratio. Taking the inadequacy of pulse protein into account 50% to 100% of the persons in all the states have diets inadequate in protein. Proportionately increased pulse intake along with increased cereal intake is the requirement of these states, to correct the unbalanced diet resulting from the disproportionately increased cereal intake and decreased pulse intake.

## II. Urban Areas

### A. Average Consumption of Energy and Protein

In the urban areas, the average calorie intake was much lower than that of the rural areas. Even in 1961-62, only seven states viz; Bihar, Haryana, Himachal Pradesh, Madhya Pradesh, Orissa, Punjab and Rajasthan were above the recommended calorie level of 2,150. The consumption of energy of urban Kerala (1,400 kcal) was as low as that of Kerala rural. In other states the average urban calorie consumption ranged between 1,500 to 2,000 kcal. In 1983, the average calorie intake was maintained above the required 2,150 level only in four states viz; Haryana, Himachal Pradesh, Punjab and Orissa. Bihar dropped down to 1,800 kcal, and Madhya Pradesh and Rajasthan to 1,900 kcal (Figure 3.3).

Among the urban areas, Kerala was the only protein deficient state in 1961-62, despite a generally lower level of protein intake in urban areas as compared to rural areas. Protein intake over the urban areas of states ranged between 50 to 60 gms. per day. In 1983, the situation worsened. General protein deficiency appeared in urban Andhra Pradesh and Gujarat as well. The level of protein intake declined in the urban areas in all the states (Figure 3.4).

### B. Consumption of Energy and Protein by Deciles

The wide range of calorie intake over the deciles in urban areas was of the same order as in the rural areas. It varied from 960 kcal (Kerala) to 2,141 kcal (Rajasthan) for the lower deciles and 2,005 kcal (Kerala) to 3,229 kcal (Rajasthan) for the upper deciles in 1961-62. In 1983 these ranges were 839 kcal (Kerala) to 1,452 kcal (Punjab) for lower deciles and 1,490 kcal (Kerala) to 2,585 kcal (Gujarat) for the upper deciles. In 1961-62, as well as in 1983, the lower deciles could not achieve the minimum recommended calorie intake. In 1961-62 the upper deciles in Kerala, too, were calorie deficient. In 1983, calorie deficiency in the upper deciles appeared in urban areas of

# PER CAPITA ENERGY INTAKE

BY STATES IN URBAN AREA

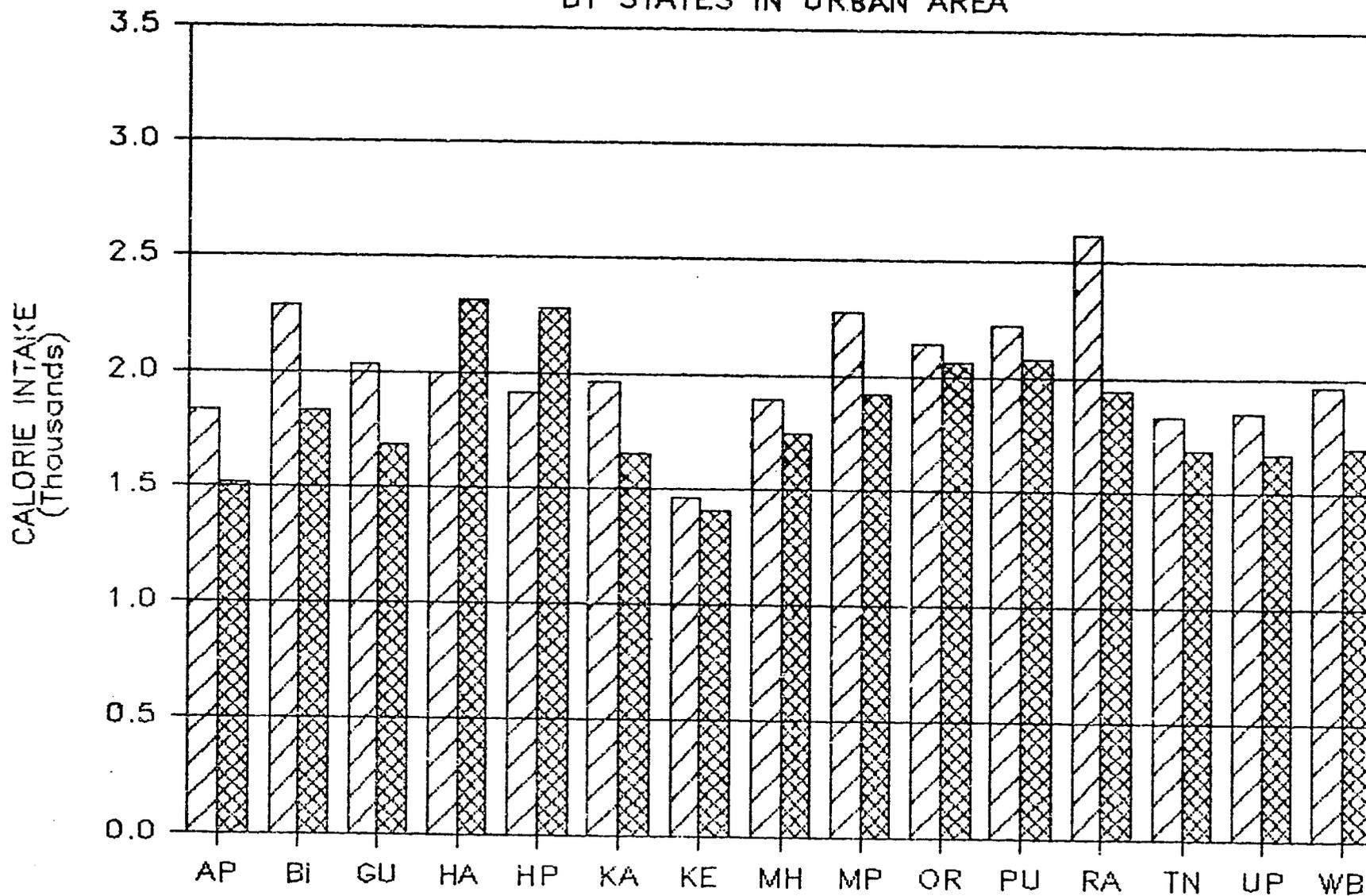


FIG. 3.3

CALORIE INTAKE  
(Thousands)

STATES



1961-62

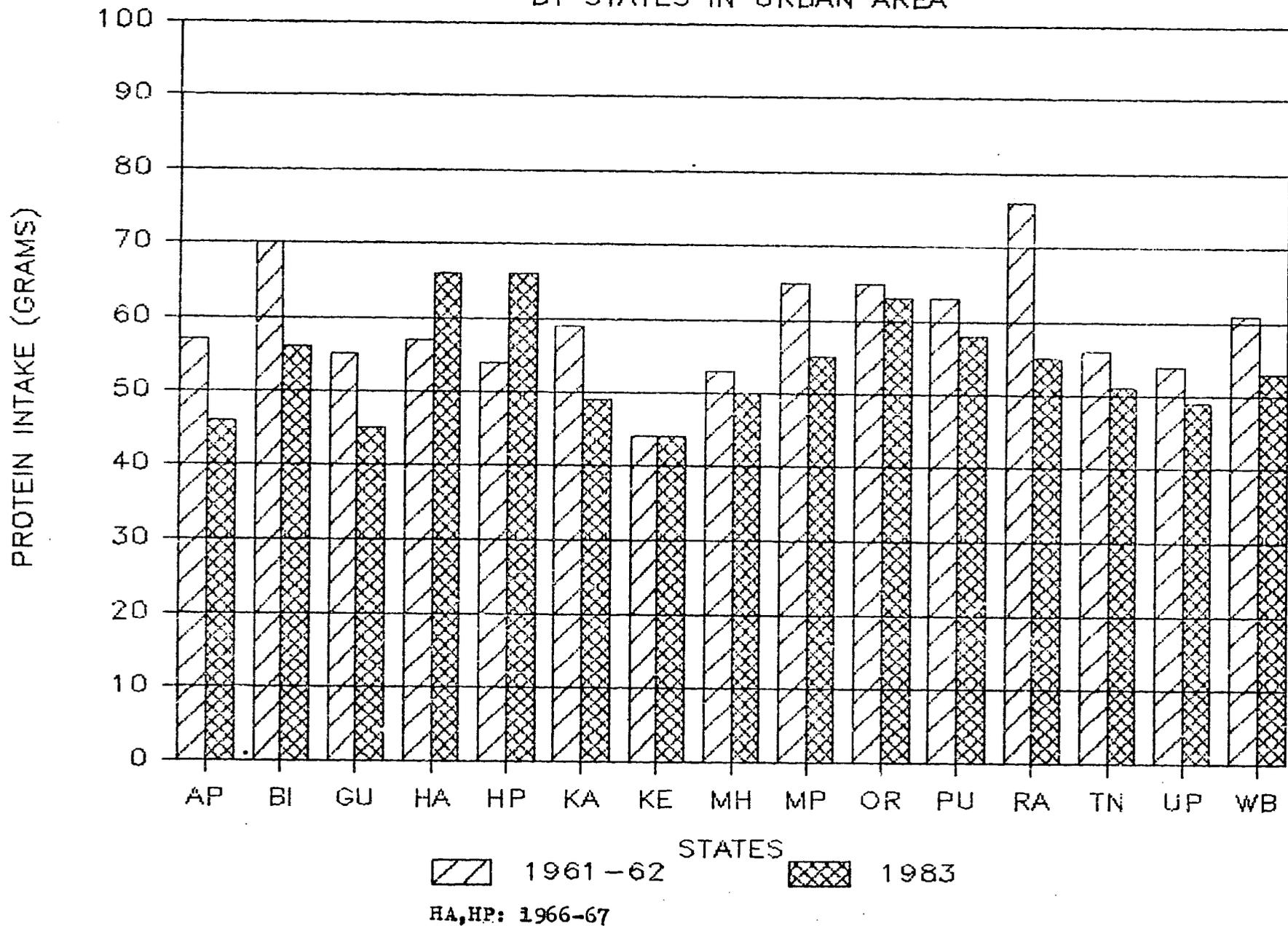


1983

HA, HP: 1966-67

# PER CAPITA PROTEIN INTAKE

BY STATES IN URBAN AREA



all the states except Gujarat, Haryana, Himachal Pradesh and Punjab (Table 3.4).

As in rural areas, the calorie intake of the lowest decile in urban areas was also around 1,100 kcal throughout the study period in all states except Kerala (550 kcal), Haryana (1,400 kcal), Punjab (1,400 kcal) and Rajasthan (1,300 kcal). In Himachal Pradesh the behavior of deciles in calorie intake is quite variable, the lowest decile's intake ranging from 600 to 1,700 K cal at different points of time.

The erratic behavior of decile groups in calorie intake in Himachal Pradesh can possibly be explained by the following:

- (i) Data from Himachal Pradesh have many gaps. In many years the first few classes are not covered, revising the calorie intake of the lower deciles.
- (ii) In some years, some of the in-between classes are not covered. That changes the calorie intake of the deciles falling near about these classes.
- (iii) The non-food expenditure of a particular class in a particular year suddenly shoots up, making the food expenditure and the corresponding calorie intake appear very low. A very small sample or some kind of natural calamity may give rise to this kind of phenomenon.

Marginal protein deficiency is observed in the lowest three deciles in urban areas in 1961-62 in Gujarat, Karnataka, Tamil Nadu and Uttar Pradesh. In Kerala the protein deficiency was quite high. In 1983, however, the deficiency of protein intake was experienced by the lowest deciles of all the states, whereas the upper deciles still managed to get an adequate quantity of protein (Table 3.5).

### C. Percentage of the Population Below ICMR Norms for Energy and Protein Intake

In 1961-62 the percentage of persons facing calorie inadequacy was higher in urban areas than in the rural areas in all the states except West Bengal. In Andhra Pradesh it was 60% urban against 40% rural, in Tamil Nadu 70% urban against 20% rural. In 1983, these percentages increased to 90% for most of the urban areas of the states. Haryana had the lowest proportion of the urban population calorie deficient (40%). Rajasthan's poverty level in urban areas in terms of calorie deficient persons increased to 80% from 10% (Table 3.6).

Protein deficiency was found in 1961-62 in less than 20% of the urban population in all the states except Kerala (40%). In 1983, it increased to 50% for Andhra Pradesh, Gujarat, Kerala, Karnataka and Maharashtra, 40% for Tamil Nadu and 20-30% for other states.

Sizable inter-state variations existed in the proportion of the population consuming an inadequate pulse to cereal protein ratio, varying from 0 to 90% in 1961-62. It was about 10% or less in Bihar, Gujarat, Karnataka, Madhya Pradesh, Maharashtra and Uttar Pradesh. In Andhra Pradesh, Rajasthan, Tamil Nadu and West Bengal this ratio exceeded 70%. In 1983 the proportion in the urban population with an inadequate pulse to cereal protein ratio was over 70% for eight states.

Table 3.4

Inter-State Variations in Calorie Intake Per Day Per Person (kcal)

Region: Urban

States	1961-62		1966-67		1970-71		1977-78		1983		Percentage Change 1983 over 1961-62	
	L.D.	U.D.	L.D.	U.D.	L.D.	U.D.	L.D.	U.D.	L.D.	U.D.	L.D.	U.D.
Andhra Pradesh	1445	2286	1086	1695	1219	1686	1301	2009	1100	1661	-24	-27
Bihar	1905	2890	1376	2501	1487	2228	1359	2073	1343	2075	-29	-28
Gujarat	1573	2707	1184	1995	1329	2075	1468	2135	1194	1783	-24	-34
Haryana	N.A.	N.A.	1488	2641	1574	2644	1640	2720	1572	2585	+5	-2
Himachal Pradesh	N.A.	N.A.	1375	1944	1430	2389	1809	2458	1447	2135	5	10
Karnataka	1441	2782	1104	1840	1184	1832	1263	1869	1116	1738	-22	-38
Kerala	960	2005	659	1437	701	1380	619	1396	839	1490	-13	-26
Madhya Pradesh	1695	2876	1354	2300	1403	2056	1427	2216	1389	2191	-18	-24
Maharashtra	1705	2454	1175	1644	1390	1656	1417	2222	1128	1676	-34	-32
Orissa	1481	2790	1350	1990	1496	2193	1326	2072	1451	2136	-2	-23
Punjab	1691	2831	1817	3048	1726	2677	1536	2455	1452	2156	-14	-24
Rajasthan	2141	3229	1623	2385	1596	2335	1550	2258	1333	2047	-38	-37
Tamil Nadu	1379	2180	977	1647	1007	1440	1058	1660	1124	1889	-18	-13
Uttar Pradesh	1417	2308	1422	2418	1319	1887	1468	2248	1214	1875	-14	-19
West Bengal	1764	2258	1425	1769	1389	1848	1288	1867	1226	1851	-30	-18

LD: Average of lowest three deciles (1, 2, &amp; 3), UD: Average of upper three deciles (7, 8 &amp; 9).

Table 3.5

Inter-State Variations in Protein Intake Per Day Per Person (gms.)

Region: Urban

States	1961-62		1966-67		1970-71		1977-78		1983		Percentage Change 1983 over 1961-62	
	L.D.	U.D.	L.D.	U.D.	L.D.	U.D.	L.D.	U.D.	L.D.	U.D.	L.D.	U.D.
Andhra Pradesh	45	70	33	51	38	52	40	62	33	50	-27	-29
Bihar	58	89	42	76	46	68	41	62	41	63	-29	-29
Gujarat	43	72	31	51	35	55	40	58	32	47	-26	-35
Haryana	N.A.	N.A.	41	74	45	74	47	80	44	75	+7	+1
Himachal Pradesh	N.A.	N.A.	36	55	39	67	53	70	41	62	+14	+13
Karnataka	44	83	33	54	36	55	38	56	33	52	-25	-37
Kerala	29	60	20	44	22	43	19	44	26	47	-10	-22
Madhya Pradesh	49	82	39	64	41	58	42	64	40	62	-18	-24
Maharashtra	48	69	31	45	40	47	41	63	32	48	-33	-30
Orissa	46	83	41	61	46	67	41	63	44	65	-4	-22
Punjab	49	79	49	86	46	75	43	69	40	60	-19	-24
Rajasthan	62	93	46	66	46	66	45	65	37	57	-40	-39
Tamil Nadu	42	67	30	50	31	44	32	51	35	57	-17	-15
Uttar Pradesh	42	67	42	71	39	55	43	66	36	54	-14	-19
West Bengal	54	70	42	54	42	57	39	57	37	57	-32	-19

LD: Average of lowest three deciles (1,2, & 3)., UD: Average of upper three deciles (7, 8 & 9).

Table 3.6

Inter-State Variations in Percentage of People Below ICMR Recommended Intake of Calories, Proteins & Ratio of Cereal Protein to Pulse Protein

Region: Urban

States	1961-62			1966-67			1970-71			1977-78			1983			Percentage Change		
	Cal.	Pro.	CP:PP	Cal.	Pro.	CP:PP	1983 Over											
	2150	45.2	4:1	2150	45.2	4:1	2150	45.2	4:1	2150	45.2	4:1	2150	45.2	4:1	1961-62		
Andhra Pradesh	60	10	90	90	60	80	90	30	80	90	20	90	90	50	80	30	40	-10
Bihar	30	0	10	60	20	100	60	10	100	80	20	90	80	20	100	50	20	90
Gujarat	40	10	0	80	0	20	80	40	0	70	20	10	90	60	0	50	50	0
Haryana	N.A.	N.A.	N.A.	40	20	100	50	10	80	50	10	60	40	20	60	0	0	-40
Himachal Pradesh	N.A.	N.A.	N.A.	30	20	40	40	20	0	60	0	30	50	20	0	20	0	-40
Karnataka	50	10	10	100	50	90	90	0	70	90	20	70	90	50	70	40	40	60
Kerala	80	40	90	100	80	100	90	80	100	100	80	90	90	70	100	10	30	10
Madhya Pradesh	30	10	0	70	30	40	90	20	20	80	20	50	70	20	30	40	10	30
Maharashtra	50	10	0	90	70	30	90	20	10	80	20	10	90	50	0	40	40	0
Orissa	60	20	20	90	20	80	70	10	100	80	20	90	70	20	100	10	0	80
Punjab	50	10	30	30	10	60	40	10	30	60	10	50	50	20	50	10	10	-30
Rajasthan	10	0	80	60	10	100	60	10	100	70	10	100	80	30	80	70	30	0
Tamil Nadu	70	20	70	90	40	80	90	50	70	90	50	70	90	40	80	20	20	10
Uttar Pradesh	70	20	0	60	20	90	90	20	30	70	10	40	90	30	60	20	10	60
West Bengal	40	10	70	90	20	100	90	20	100	90	20	100	90	30	100	50	20	30

Foot Note: ICMR: Recommended Daily Intakes: Cal = Calories \_\_ 2,150 K Cal, Pro = Protein \_\_ 45.2 gms., CP:PP = Cereal Protein to Pulse Protein and greater than 4:1

CHAPTER - 4INTER STATE VARIATIONS IN DAILY DIET1. Rural AreasA. Average Daily Consumption of Cereals, Pulses and Milk

In 1961-62, in the rural areas, diet rich states were Rajasthan, Punjab, Haryana, Himachal Pradesh and Gujarat. The population of these states, on the average, consumed daily over 250 ml. of milk, over 500 grams of cereals and 50 gms. of pulses. These quantities are enough to provide an adequate diet to an average person though slightly imbalanced in favor of cereals. The ICMR recommended balanced diet for an adult male doing moderate work includes 520 gms. of cereals, 50 gms. of pulses, and 200 mls. of milk. The average per capita requirement at the physiological level for cereals is 386 gms., for pulses 43 gms., and for milk 200 mls. The Karnataka and Madhya Pradesh average diet included more cereals (700 grams) and less milk (150 ml.). The average person's diet in Uttar Pradesh contained more pulses (95 grams per day) and less milk (150 ml.). People of these states enjoyed quantitatively adequate but qualitatively imbalanced diets in 1961-62. The states with sufficient consumption of cereals and pulses (525 grams and 60 grams) though slightly imbalanced due to less milk were Bihar and Maharashtra (Tables 4.1, 4.2 & 4.3).

In Andhra Pradesh, Orissa, Tamil Nadu and West Bengal, people on the average consumed an adequate quantity of cereals i.e. over 550 grams per day but not enough pulses (30-40 gms.) or milk (40-60 ml.). Kerala was one state which faced real shortages of cereals, milk and pulses. Consumption levels in Kerala were 352 grams of cereals, 15 grams of pulses and 33 ml. of milk per day.

B. Daily Consumption of Cereals, Pulses and Milk by Deciles

The states where the three lowest deciles, on the average, were consuming the minimum recommended diet were Punjab, Haryana, Himachal Pradesh and Gujarat; Rajasthan was border line. In these states, the diet of the lowest deciles comprised of 500 grams of cereals, 40 grams of pulses and 100 ml. of milk per day. In Madhya Pradesh and Karnataka people in the lowest deciles could procure enough cereals (570-590 gms.) and pulses (43-50 gms.) but less milk (31-52 mls.).

In Uttar Pradesh and Maharashtra, the cereal and milk consumption was poor but pulses consumption was upto the mark. In other states like Andhra Pradesh, Kerala, Orissa, Tamil Nadu and West Bengal, both the quantity and quality of the diet were poor for the lower deciles.

In Kerala even the upper deciles could not procure enough cereals, pulses and milk to provide them a nutritious diet. The fish consumption in Kerala could not compensate for this inadequacy.

In 1983, the average consumption of cereals declined in all the states by about 30%, except in Orissa where it increased by 7%. The consumption of pulses declined in all the states by about 40-50%, except in Himachal Pradesh

Table 4.1

Inter-State Variations in Cereal Consumption  
(gms per day)

Region: Rural

States	1961-62			1966-67			1970-71			1977-78			1983			Percentage Change 1983 over 1961-62		
	A.	L.D.	U.D.	A.	L.D.	U.D.	A.	L.D.	U.D.									
Andhra Pradesh	584	445	732	472	378	567	471	362	553	524	417	576	434	337	503	-26	-24	-31
Bihar	619	481	855	574	336	798	515	367	624	531	368	627	525	366	620	-15	-24	-27
Gujarat	556	521	610	397	296	504	389	298	424	442	389	481	340	265	377	-39	-49	-38
Haryana	N.A.	N.A.	N.A.	662	507	781	582	387	608	510	413	594	438	349	502	-34	-31	-36
Himachal Pradesh	N.A.	N.A.	N.A.	582	488	738	524	434	597	545	462	568	501	382	542	-14	-22	-26
Karnataka	696	507	872	518	351	560	458	332	504	498	341	525	435	287	457	-38	-43	-48
Kerala	352	251	477	232	164	302	267	183	299	302	197	468	344	246	403	-2	-2	-16
Madhya Pradesh	711	579	857	546	377	678	475	355	538	415	336	457	488	370	540	-31	-36	-37
Maharashtra	528	420	692	400	304	490	398	342	450	442	357	498	360	275	404	-32	-34	-42
Orissa	610	421	761	589	413	734	530	330	618	535	359	642	656	447	759	7	6	0
Punjab	611	479	652	609	464	704	506	377	547	472	356	587	413	313	479	-32	-35	-26
Rajasthan	750	597	927	653	503	744	437	373	496	606	466	690	481	390	504	-36	-35	-46
Tamil Nadu	563	415	674	496	345	604	428	301	494	460	351	537	497	339	586	-12	-18	-13
Uttar Pradesh	612	466	699	660	436	787	482	341	555	548	439	544	446	347	494	-27	-25	-29
West Bengal	566	451	638	525	351	635	489	319	563	489	359	571	526	352	611	-7	-22	-4

A: Average of all classes., LD: Average of lowest three deciles (1, 2, & 3)., UD: Average of upper three deciles (7, 8 & 9).

Table 4.2

Inter-State Variations in Consumption of Pulses  
(gms per day per person)

Region: Rural

States	1961-62			1966-67			1970-71			1977-78			1983			Percentage Change 1983 over 1961-62		
	A.	L.D.	U.D.	A.	L.D.	U.D.	A.	L.D.	U.D.									
Andhra Pradesh	34	19	45	23	10	32	25	12	30	25	12	31	26	15	32	-24	-21	-3
Bihar	60	40	83	33	15	40	34	15	41	30	15	39	21	10	27	-65	-75	-67
Gujarat	66	50	80	29	17	38	38	21	44	41	29	48	37	25	41	-44	-50	-49
Haryana	N.A.	N.A.	N.A.	33	21	39	40	25	47	28	17	36	34	21	42	3	0	8
Himachal Pradesh	N.A.	N.A.	N.A.	41	36	51	53	40	60	46	31	53	48	34	49	17	-6	-4
Karnataka	68	43	84	26	15	33	31	18	34	33	18	38	32	18	35	-53	-58	-58
Kerala	15	4	25	4	1	6	9	2	11	11	3	14	13	5	16	-13	25	-36
Madhya Pradesh	79	50	104	37	19	51	34	18	40	29	16	38	37	20	46	-53	-60	-56
Maharashtra	61	47	78	35	21	47	37	22	43	40	26	47	37	25	42	-39	-47	-46
Orissa	39	15	51	21	6	28	17	3	18	13	3	18	15	4	20	-62	-73	-51
Punjab	53	39	63	49	33	60	49	35	52	47	30	58	47	32	55	-11	-18	-13
Rajasthan	57	37	70	25	16	30	23	9	28	28	16	33	26	13	30	-54	-65	-57
Tamil Nadu	40	15	62	25	10	36	24	11	29	24	10	31	26	11	32	-35	-27	-48
Uttar Pradesh	95	66	107	54	33	66	52	30	62	59	36	67	39	24	47	-59	-64	-56
West Bengal	27	26	31	17	7	22	17	8	19	16	7	22	13	6	16	-52	-77	-48

A: Average of all classes., LD: Average of lowest three deciles (1,2, & 3)., UD: Average of upper three deciles (7, 8 & 9).

Table 4.3  
Inter-State Variations in Milk Consumption  
(ml. per day per person)

Region: Rural

States	1961-62			1966-67			1970-71			1977-78			1983			Percentage Change 1983 over 1961-62		
	A.	L.D.	U.D.	A.	L.D.	U.D.	A.	L.D.	U.D.									
Andhra Pradesh	59	9	94	53	15	75	51	9	58	68	19	114	66	21	86	+12	+133	-8
Bihar	59	14	90	49	10	62	51	5	55	54	11	78	50	6	68	-15	-57	-25
Gujarat	253	114	334	157	44	241	183	60	242	218	76	295	204	100	254	-19	-12	-24
Haryana	N.A.	N.A.	N.A.	548	222	653	479	216	602	578	238	788	584	271	755	+6	+22	+16
Himachal Pradesh	N.A.	N.A.	N.A.	238	146	347	255	139	310	269	145	283	289	128	339	+21	-14	-2
Karnataka	109	52	127	58	22	82	74	18	84	75	26	95	76	36	82	-30	-32	-36
Kerala	33	8	46	29	6	38	40	7	46	53	13	73	59	16	80	+80	+100	+74
Madhya Pradesh	138	31	190	92	22	123	86	17	95	80	16	111	87	22	123	-37	-29	-35
Maharashtra	82	38	127	68	31	93	79	26	93	80	30	99	76	28	94	-7	-26	-26
Orissa	20	4	22	17	2	23	16	2	16	19	2	27	20	2	29	0	-50	+32
Punjab	550	184	757	546	209	760	558	239	671	591	260	800	532	256	708	-3	+39	-6
Rajasthan	338	91	473	310	102	404	286	66	341	417	150	561	334	107	452	-1	+18	-4
Tamil Nadu	39	6	57	32	6	40	32	3	38	39	5	48	48	7	62	+23	+17	+9
Uttar Pradesh	158	50	248	126	32	189	135	28	160	168	42	230	147	36	204	-7	-28	-18
West Bengal	49	11	70	38	8	55	38	4	43	42	5	58	42	8	56	-14	-27	-20

A: Average of all classes., LD: Average of lowest three deciles (1,2, & 3)., UD: Average of upper three deciles (7, 8 & 9).

and Punjab. In Punjab the decline was 11% and in Himachal Pradesh pulse consumption increased marginally. Milk consumption declined in Bihar, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Uttar Pradesh and West Bengal by about 10 to 20%. In the rest of the states milk consumption increased. The rate of increase varied from 6% in Haryana to 80% in Kerala.

In 1983, the states with adequate diets were Haryana, Punjab, Himachal Pradesh and Rajasthan. The diet in Gujarat deteriorated due to a drastic reduction in cereal consumption from 556 gms. to 340 gms. per day and pulse consumption from 66 grams to 37 grams per day. Milk consumption in Gujarat declined as well from 253 ml. to 204 ml. Madhya Pradesh, Karnataka and Uttar Pradesh also deteriorated into diet deficient states from former diet adequate states because of steep declines in cereal and pulse consumption. Bihar still maintained adequate quantities of cereal consumption but was seriously deficient in pulses and milk. In Orissa, marginally increased consumption of cereals was offset by a sharp decline in pulses to a low level of 15 gms. per day. In Tamil Nadu, increased milk consumption was not enough to compensate for fall in cereal and pulse consumption.

A balanced diet, according to ICMR, should contain at least 100 milliliters of milk everyday in order to meet calcium and protein requirements. In 1961-62, a sufficiently high proportion of persons (40-100%) in ten states did not consume this much milk. Milk consumption in sufficient quantities was achieved in Punjab, Haryana and Himachal Pradesh. In Gujarat and Rajasthan a milk shortage was faced by 10 and 20% of the population respectively. In 1983, milk deficient states became worse off and milk sufficient states became better off (Table 4.4).

These shortages in 1983 were distributed over the deciles quite uniformly. The lower deciles who could earlier just manage an adequate diet or a slightly deficient one, had their diets deteriorate severely to the point where they joined the abject poor. The poverty level thus increased substantially in most of the states from 1961 to 1983.

## II. Urban Areas

### A. Average Daily Consumption of Cereals, Pulses and Milk

In urban areas in 1961-62, all the states with the exception of Kerala and Andhra Pradesh consumed on the average enough milk and pulses but generally were short on cereals. Cereal and pulse consumption was adequate around 500 grams and over 45 gms. per day respectively, in Bihar, Rajasthan and Orissa. Bihar and Orissa were slightly inadequate in milk consumption. Andhra Pradesh, Karnataka, Madhya Pradesh, Punjab, Tamil Nadu and West Bengal consumed about 450 grams. of cereals 40 gms. of pulses and 100 mls. of milk per day. Gujarat, Kerala, Maharashtra and Uttar Pradesh consumed about 360 grams of cereals per day. Consumption of milk and pulses in these states, except Kerala, were at a moderate level of about 50 gms. of pulses and 200 mls. of milk, not enough to compensate for the cereal deficiency (Tables 4.5, 4.6 & 4.7).

Table 4.4

Inter-State Variations in Percentage of People  
Below ICMR Recommended Intake

Region: Rural

States	1961-62		1966-67		1970-71		1977-78		1983	
	Milk	Oil	Milk	Oil	Milk	Oil	Milk	Oil	Milk	Oil
Andhra Pradesh	80	100	80	100	90	100	80	100	80	100
Bihar	80	100	90	100	90	100	80	100	90	100
Gujarat	10	90	40	100	40	100	20	100	10	100
Haryana	N.A.	N.A.	0	100	0	100	0	100	0	100
Himachal Pradesh	N.A.	N.A.	0	100	10	100	10	100	0	100
Karnataka	40	100	90	100	80	100	80	100	90	100
Kerala	90	100	100	100	90	100	90	100	80	100
Madhya Pradesh	60	90	70	100	80	100	70	100	70	90
Maharashtra	60	100	80	100	80	100	80	100	80	100
Orissa	100	100	100	100	100	100	100	100	100	100
Punjab	0	90	0	90	0	90	0	90	0	90
Rajasthan	20	90	10	100	20	100	10	100	10	100
Tamil Nadu	90	100	90	100	90	100	90	100	90	100
Uttar Pradesh	40	100	60	100	50	100	50	100	40	90
West Bengal	90	100	90	100	90	100	90	100	90	100

M : Milk consumption less than 100 mls per person per day., O : Oil consumption less than 31 gms per person per day.

Table 4.5

Inter-State Variations in Cereal Consumption  
(gms per day per person)

Region: Urban

States	1961-62			1966-67			1970-71			1977-78			1983			Percentage Change 1983 over 1961-62		
	A.	L.D.	U.D.	A.	L.D.	U.D.	A.	L.D.	U.D.									
Andhra Pradesh	458	389	547	335	289	379	382	332	383	427	361	473	344	285	354	-25	-27	-35
Bihar	529	495	617	460	364	618	444	396	509	442	371	472	463	385	508	-12	-22	-18
Gujarat	372	321	472	271	233	334	300	262	363	338	303	354	272	219	273	-27	-32	-21
Haryana	N.A.	N.A.	N.A.	451	316	499	400	328	452	409	359	430	380	321	375	-16	+2	-25
Himachal Pradesh	N.A.	N.A.	N.A.	301	258	258	372	299	383	387	406	391	389	326	347	+29	+26	+34
Karnataka	463	361	624	355	288	420	372	302	408	417	333	416	363	273	365	-22	-24	-42
Kerala	355	257	473	234	168	311	251	165	294	263	165	309	329	229	331	-7	-11	-30
Madhya Pradesh	450	375	546	385	313	443	390	336	391	418	355	441	395	333	432	-12	-11	-21
Maharashtra	414	367	434	224	246	218	297	298	239	328	318	359	307	241	267	-14	-34	-38
Orissa	490	399	588	459	387	459	465	420	495	460	390	486	544	440	554	+11	+10	-6
Punjab	412	406	469	453	381	519	389	330	419	356	308	385	316	257	311	-23	-27	-34
Rajasthan	514	451	602	391	370	412	378	365	413	413	360	415	361	294	352	-30	-35	-42
Tamil Nadu	447	377	510	335	270	381	321	271	342	353	289	379	411	315	437	-8	-16	-14
Uttar Pradesh	367	312	415	423	342	514	360	310	353	415	348	425	332	290	354	-10	-7	-22
West Bengal	481	456	477	363	358	352	392	351	384	397	338	403	402	327	423	-32	-28	-11

A: Average of all classes., LD: Average of lowest three deciles (1, 2, & 3)., UD: Average of upper three deciles (7, 8 & 9).

Table 4.6

Inter-State Variations in Consumption of Pulses  
(gms per day per person)

Region: Urban

States	1961-62			1966-67			1970-71			1977-78			1983			Percentage Change 1983 over 1961-62		
	A.	L.D.	U.D.	A.	L.D.	U.D.	A.	L.D.	U.D.									
Andhra Pradesh	37	25	51	26	15	34	30	18	34	32	17	40	30	18	51	-19	-28	0
Bihar	64	54	85	31	21	45	40	30	48	36	24	43	26	16	32	-59	-70	-62
Gujarat	66	40	79	29	23	45	38	31	53	41	33	53	37	26	40	-44	-35	-49
Haryana	N.A.	N.A.	N.A.	31	21	39	35	45	47	36	17	36	41	21	42	+32	0	+8
Himachal Pradesh	N.A.	N.A.	N.A.	38	30	37	43	34	46	46	34	54	46	29	43	+21	-3	+16
Karnataka	55	36	83	27	17	36	37	24	42	38	22	42	35	22	38	-36	-39	-54
Kerala	22	6	32	8	2	26	14	4	17	13	2	18	16	5	19	-27	-17	-41
Madhya Pradesh	66	46	81	40	25	48	48	31	52	45	28	53	44	28	53	-33	-39	-35
Maharashtra	49	44	63	36	19	42	42	35	41	44	32	53	40	26	38	-18	-41	-40
Orissa	59	31	82	29	18	38	33	17	43	28	14	37	27	10	30	-54	-68	-73
Punjab	43	29	54	39	26	51	42	32	47	37	26	41	40	27	41	-7	-7	-24
Rajasthan	45	37	59	27	20	33	28	22	34	30	19	32	29	18	32	-26	-51	-46
Tamil Nadu	40	24	54	25	12	33	28	16	32	28	14	37	30	15	38	-25	-38	-30
Uttar Pradesh	49	39	63	37	26	48	42	29	46	49	33	57	36	24	42	-27	-39	-33
West Bengal	38	31	48	27	22	31	27	20	29	28	18	32	21	14	24	-45	-55	-50

A: Average of all classes., LD: Average of lowest three deciles (1,2, & 3)., UD: Average of upper three deciles (7, 8 & 9).

Table 4.7

Inter-State Variations in Milk Consumption  
(ml per day per person)

Region: Urban

States	1961-62			1966-67			1970-71			1977-78			1983			Percentage Change		
	A.	L.D.	U.D.	A.	L.D.	U.D.	A.	L.D.	U.D.									
Andhra Pradesh	95	30	149	98	30	138	91	27	115	113	39	148	116	43	153	+22	+43	+3
Bihar	158	23	293	86	17	128	102	15	138	106	18	141	93	18	125	-59	-22	-57
Gujarat	273	145	372	178	85	243	179	90	226	243	111	306	230	116	268	-16	-20	-28
Haryana	N.A.	N.A.	N.A.	359	181	419	355	148	460	487	196	668	465	185	619	+30	+2	+74
Himachal Pradesh	N.A.	N.A.	N.A.	374	130	455	320	106	436	382	190	467	407	194	412	+9	+49	-9
Karnataka	118	56	195	94	33	138	104	34	128	132	43	160	128	47	157	+8	-15	-20
Kerala	65	7	125	57	10	118	63	13	84	69	9	103	88	17	112	+35	+143	-10
Madhya Pradesh	235	117	329	174	52	220	166	50	197	181	64	239	176	64	219	-25	-45	-34
Maharashtra	208	102	308	190	62	272	178	59	262	209	63	253	210	56	254	+1	-45	-18
Orissa	114	24	181	84	11	128	78	12	105	93	11	130	70	7	73	-38	-68	-60
Punjab	364	101	573	401	177	620	405	204	528	449	201	526	420	221	464	+15	+119	-19
Rajasthan	381	202	523	278	124	380	300	113	391	332	154	406	323	142	389	-15	-30	-26
Tamil Nadu	107	23	151	81	19	112	81	18	107	86	22	116	107	28	139	0	+22	-11
Uttar Pradesh	185	47	263	168	42	220	162	45	213	220	76	280	191	67	242	+3	+43	-11
West Bengal	159	49	218	112	37	167	112	33	147	117	28	148	116	38	146	-27	-22	-33

A: Average of all classes., LD: Average of lowest three deciles (1,2, & 3)., UD: Average of upper three deciles (7, 8 & 9).

### B. Daily Consumption of Cereals, Pulses and Milk by Deciles

The consumption level of the lower deciles was around 300 grams of cereals, 30 grams of pulses and about 150 ml. of milk in Punjab, Haryana, Himachal Pradesh and Rajasthan. This was the best for the lower deciles in any state. In Bihar the lower deciles were short on milk, in Gujarat and Madhya Pradesh in cereals; Maharashtra in cereals and pulses; and other states in all the three commodities.

The consumption level of the upper deciles was not much better. The differences between lower and upper deciles with respect to consumption of food articles were less pronounced in urban areas than in rural areas. Serious cereal deficiency is obvious even among the upper deciles in all the states barring Bihar and Orissa. The level of pulse and milk consumption is barely sufficient in these states. This leaves even the upper deciles in all the states with diets deficient in either cereals, pulses or milk.

Cereal and pulse consumption declined during 1961-83 in all the states and across the deciles except in Orissa. Milk consumption improved in some states and deteriorated in others. Consumption of cereals and pulses is lower in urban areas than rural areas but that of milk slightly higher. Urban areas were a little better than rural areas in milk consumption. The percentage of urban people with inadequate milk intake was nil in Punjab, Haryana, Himachal Pradesh and Gujarat, 10% in Rajasthan, Madhya Pradesh and Maharashtra and ranged between 40% and 70% in the deficient states. The situation was almost the same in 1983 (Table 4.8). The increases in milk consumption were appropriated by the upper deciles and not much could trickle down to the lower deciles. On the whole, the urban areas of all the states have diets which are poorer in quantity and quality of food than rural areas.

Diet with oil intake of at least 31 gms per day is again recommended by the ICMR for a balanced diet. This requirement was not met on the average by 90% of the persons in rural or urban areas throughout the period. (Table 4.4 & 4.8).

### III. Foodgrain Production And Consumption Linkages.

In this section an elementary analysis has been attempted to examine the linkage between estimated consumption and production of foodgrains in various states. The effort is to determine the nature of the relationship between production and consumption.

In Table 4.9 are presented the per capita net production and the estimated per capita consumption of foodgrains and their differences for the fifteen study states for the years 1961-62, 1970-71, 1977-78 and 1983-84 (1983 consumption). The following features can be highlighted.

- (1) The estimated per capita consumption in 1961-62 was in excess of net production in that year by a substantial margin in all the states. The excess was higher than the reported imports of 3.5 million tonnes of foodgrains in that year. The NSSO estimates of 1961-62, therefore, appear to be over estimated.

Table 4.8

Inter-State Variations in Percentage of People  
Below ICMR Recommended Intake

Region: Urban

States	1961-62		1966-67		1970-71		1977-78		1983	
	Milk	Oil	Milk	Oil	Milk	Oil	Milk	Oil	Milk	Oil
Andhra Pradesh	60	100	70	100	70	100	60	100	50	100
Bihar	60	100	70	100	70	100	50	100	70	100
Gujarat	0	80	20	70	20	90	10	80	10	80
Haryana	N.A.	N.A.	0	90	10	90	0	90	0	90
Himachal Pradesh	N.A.	N.A.	10	60	10	80	0	90	0	90
Karnataka	50	100	60	100	60	100	50	100	50	100
Kerala	70	100	70	100	80	100	80	100	70	100
Madhya Pradesh	10	100	40	90	30	90	40	90	30	90
Maharashtra	10	90	30	90	40	90	30	90	40	90
Orissa	60	90	70	100	80	90	70	100	80	100
Punjab	10	80	0	90	0	80	0	90	0	90
Rajasthan	0	90	10	90	10	90	0	90	0	90
Tamil Nadu	60	100	70	100	80	100	70	100	60	100
Uttar Pradesh	40	100	40	90	40	90	20	90	30	90
West Bengal	40	100	50	100	60	90	50	100	60	100

M : Milk consumption less than 100 mls per person per day., O : Oil consumption less than 31 gms per person per day.

Table 4.9

Annual Per Capita Consumption and Production of Foodgrains by States (Kg)

States	Food Grain Consumption				Food Grain Production (Net)				Food Grain deficit : Production - Consumption			
	1961-62	1970-71	1977-78	1983	1961-62	1970-71	1977-78	1983	1961-62	1970-71	1977-78	1983
Andhra Pradesh	218	175	193	161	159	128	134	161	- 59	-47	-59	0
Bihar	245	198	201	197	120	105	111	104	-125	-93	-90	-93
Gujarat	168	147	164	130	94	124	92	126	- 74	-23	-72	- 4
Haryana	-	215	179	168	299	355	335	401	-	140	156	233
Himachal Pradesh	-	206	211	197	101	206	199	178	-	0	12	-19
Karnataka	217	171	176	162	131	152	162	159	- 88	-19	-14	- 3
Kerala	134	100	112	130	46	47	41	38	- 88	-53	-71	-92
Madhya Pradesh	271	172	164	175	216	198	190	220	- 55	24	26	45
Maharashtra	213	148	142	139	122	83	134	130	- 91	-65	- 8	- 9
Orissa	235	198	197	241	172	174	168	194	- 63	-24	-29	-47
Punjab	225	192	177	158	220	404	505	660	- 5	212	328	502
Rajasthan	280	164	217	176	238	257	170	221	- 42	93	-47	45
Tamil Nadu	209	154	164	172	127	127	126	96	- 82	-27	-38	-76
Uttar Pradesh	244	178	212	169	143	222	158	198	-101	-11	-54	29
West Bengal	207	176	177	186	113	127	134	126	- 94	-49	-43	-60

Production figures are adjusted for seed, feed, wastage etc. A proportion of 25% is worked out on the basis of net availability of foodgrains from production and actual level of production at all India level.

Source: Centre For Monitoring Indian Economy.

- (11) Consumption of foodgrains per capita declined during 1970-71 to 1983 in nine out of the fifteen states, whereas net production of foodgrains increased during this period in nine out of fifteen states. Punjab and Haryana emerged as heavy surplus states and Madhya Pradesh as a low surplus state. Uttar Pradesh turned slowly from a deficit to a marginal surplus state. Rajasthan shifted between deficit and surplus. All other states continued to be foodgrain deficit states.
- (111) The income effect as described by the Engle's Law (Mellar ) seems to be influencing the pattern of consumption of foodgrains. The level of foodgrain consumption appears to be negatively associated with the level of foodgrain production. In 1983, the surplus states of Punjab and Haryana consumed less foodgrain (158 and 168 kgs. per year per person) than many other low producing states like Bihar (197 kgs/year), Orissa (241 kgs/year) and West Bengal (186 kgs/year). The large marketable surplus in these states generated enough income to allow consumers to shift to other kinds of food, particularly milk. The level of expenditure on food in these states is much higher than in other states. In 1983, the proportion of total food expenditure on cereal was 27% and 32% in Punjab and Haryana whereas the share of milk was 35% and 44% respectively. The expenditure on milk, thus, exceeded the expenditure on cereals in these two states. The proportions in Bihar for total food expenditure was 71% for cereals and 6.8% for milk, and in Orissa 76% on cereals and 2.3% for milk. Although foodgrain production and foodgrain consumption are negatively associated, the total expenditure on food is positively associated with the production of foodgrains.
- (1v) The surplus foodgrains produced by Punjab and Haryana do suffice on the average to maintain the current level of consumption of foodgrains in the country or even to increase it marginally. But the law of averages is not what is followed by people in the distribution of grains. The foodgrains acquired by individual households depend on their capacity to buy and that remains limited as long as their earning capacity remains low. The improvement in the level of consumption of the lower classes mainly depends on increases in their income through on farm or off farm employment. Both are difficult, but the former may be less difficult to accomplish.

## CHAPTER - 5

### MEASUREMENT OF POVERTY

#### I. Definition of Poverty

The poor, in absolute terms can be defined to be the persons who cannot procure for themselves and their families certain basic necessities which are considered essential for human beings. Food being the most pressing requirement of a person, its consumption was recognized as the classificatory factor in the identification of the poor.

The human body's requirement for food is defined in terms of nutrients like calories, proteins etc. The ICMR has worked out age, sex and work specific dietary recommended intakes for Indians. The average recommended calorie intake per person per day works out to 2,150 (Norm I). This average intake is valid in rural as well as urban areas considering agricultural workers as moderately active. A maximum level of 2,800 calories (Norm II) has been suggested by ICMR to give an allowance for the wastage factor in storage and processing of food. A minimum intake of 1,800 calories (Norm III) has been suggested in the report of the Study Group on the concept and Estimation of Poverty Line (Perspective Planning Division of the Planning Commission).

The expenditure equivalent' of these calorie norms at 1970-71 prices has been worked out at Rs. 40 (Norm I), Rs. 50 (Norm II) and Rs. 30 (Norm III) as follows: findings of this study have shown that 60% of total expenditure is spent on calorie giving food (proportion of total expenditure on food is 70% and of this 85% is on calorie giving food) and assuming that this food consists of foodgrains only the 'equivalent' expenditure is:

$$\frac{2150}{347} \times 1.27 \times \frac{100}{60} \times 30 = \text{Rs. } 40 \quad (\text{Norm I})$$

$$\frac{2800}{347} \times 1.27 \times \frac{100}{60} \times 30 = \text{Rs. } 50 \quad (\text{Norm II})$$

$$\frac{1800}{347} \times 1.27 \times \frac{100}{65} \times 30 = \text{Rs. } 30 \quad (\text{Norm III})$$

(Rs. 1.27 is the price of 1 kg. foodgrains at 1970-71 prices and there are 347 calories per 100 grams. of foodgrains)

Assuming a higher percentage of expenditure on food (65%) by the poorest.

An expenditure level of Rs. 30 per month per capita at 1970-71 prices is close to the poverty line adopted by Montek Ahluwalia and the Planning Commission. These expenditure equivalents provide for the least expensive calories, i.e. foodgrains.

#### II. Income Distribution

The poverty estimates on the basis of all the three norms for rural and urban areas reveal a great similarity in the trends. The proportion of persons between the estimates at various points of time, also is quite constant in most of the states. If persons X, in one year, are pushed below the poverty

line of Rs. 30, then persons X are also pushed below Rs. 40 and Rs. 50 per capita expenditure lines. i.e. in such years there is an across the board decline in per capita expenditure.

The Gini's coefficients vary widely over the states ranging from 0.20 to 0.33 in 1961-62 and decline marginally over time. The inequalities of incomes are not linked with the levels of poverty. The Gini's coefficient in 1961-62 was highest for Punjab (0.33) and lowest for Gujarat, both with very low poverty levels. The inter-state difference in income inequalities declined over time. The range of Gini's coefficients was 0.22 to 0.30 in 1983.

### III. Rural Poverty

In 1961-62 the percentage of people below the poverty line (real expenditure - Rs. 40 per month per person) was relatively low in Gujarat (10%), Punjab including Haryana and Himachal Pradesh (12%), Rajasthan (15%), Uttar Pradesh (24%), Maharashtra (32%) and Karnataka (21%) and was high in Bihar (38%), Tamil Nadu (44%), Orissa (48%), Andhra Pradesh (46%), West Bengal (59%), and Kerala (54%) (Table 5.1)

By 1971 the proportion of poor reached a peak level in most of the states. The level ranged from 9 % in Punjab to 82% in Kerala. In eight states this level was over 70%, and in two states between 40% and 50%. In Bihar, it rose to 76%. In Madhya Pradesh the peak level was 79% in 1978.

The proportion of poor continuously increased during 1962-1968, in Bihar, Karnataka, Kerala and Orissa. It marginally increased in Madhya Pradesh and Maharashtra and declined slightly in Himachal Pradesh, Punjab and Rajasthan. (In Rajasthan it declined continuously till 1978 but increased during 1978-1983).

During 1971-78, generally, this proportion declined for most of the states except Himachal Pradesh and Madhya Pradesh. This improvement proved to be temporary and the proportion of poor again increased in 1978-83. It is too early to confirm the reversal of trend in the number and proportion of people below the poverty line.

In rural areas the average expenditure of those below the poverty line, in 1961-62, indicated small inter-state variations, the lowest was for Kerala (Rs. 26) and the highest was for Rajasthan (Rs. 34), with 50% of the states over Rs. 30. This range, in 1983 narrowed to Rs. 27 (Bihar) and Rs. 34 (Punjab). Gujarat, Haryana, Himachal Pradesh and Punjab were the only states where the poor spent over Rs. 30 per capita per month at 1970-71 prices even in 1983. This points to worsening of the status of the poor. In many states, the poor became poorer. The lot of the poor improved marginally in Kerala and was maintained in Andhra Pradesh and Orissa.

### IV. Urban Poverty.

Urban poverty basically followed the pattern of rural poverty. Uptrends and downtrends in the poverty curves in rural and urban areas are alike. The proportion of people below the consumption level of Rs. 40 in real terms was between 9% to 48% in 1961-62. The level of poverty was lower in urban areas

Table 5.1

Inter-State Variations in Gini's Co-efficient, Percent of People and Mean Expenditure  
of People Below Rs. 40 Per capita Per month Expenditure at 1970-71 Prices

Region: Rural

States	1961-62			1966-67			1970-71			1977-78			1983			Percentage Change 1983 over 1962-63	
	People %	Mean Expen.	Ginis coeff.	People %	Mean Expen.												
Andhra Pradesh	46	28.90	0.26	67	29.47	0.24	70	28.00	0.23	55	29.35	0.26	64	28.89	0.26	+13	+3
Bihar	38	30.67	0.23	59	27.07	0.26	76	27.02	0.22	74	26.98	0.23	82	26.61	0.23	+48	-6
Gujarat	10	32.95	0.20	56	28.36	0.24	66	30.06	0.22	40	31.78	0.23	53	31.44	0.22	+19	-9
Haryana	N.A.	N.A.	N.A.	12	33.70	0.24	23	33.58	0.25	18	32.50	0.24	18	33.58	0.25	+1	-2
Himachal Pradesh	N.A.	N.A.	N.A.	29	35.06	0.27	22	34.37	0.22	27	33.78	0.23	30	32.52	0.23	+4	-7
Karnataka	21	31.02	0.30	61	28.32	0.25	71	28.31	0.22	56	28.36	0.25	76	29.46	0.25	+23	-15
Kerala	54	25.54	0.28	85	23.24	0.25	83	23.31	0.26	70	25.67	0.32	63	27.83	0.29	+9	+5
Madhya Pradesh	23	32.40	0.29	51	28.36	0.25	74	27.06	0.25	79	24.67	0.28	67	27.59	0.27	+32	-11
Maharashtra	32	31.72	0.24	62	30.94	0.23	66	30.15	0.19	56	30.19	0.23	65	29.14	0.25	+26	-6
Orissa	48	28.13	0.26	66	28.37	0.22	82	24.94	0.25	78	25.08	0.27	68	28.09	0.25	+15	+1
Punjab	12	32.45	0.33	11	33.57	0.31	9	33.50	0.28	9	31.41	0.30	10	34.39	0.27	-4	-11
Rajasthan	15	34.14	0.31	22	29.77	0.30	50	28.11	0.28	25	32.42	0.32	39	29.66	0.30	-23	-8
Tamil Nadu	44	29.58	0.28	66	28.83	0.25	79	26.34	0.23	71	27.20	0.23	66	27.82	0.28	+20	+4
Uttar Pradesh	24	31.35	0.29	38	30.52	0.26	61	28.68	0.27	46	31.99	0.26	56	28.95	0.26	+22	-7
West Bengal	59	29.90	0.24	78	27.86	0.24	84	25.15	0.24	71	26.34	0.26	81	26.78	0.25	+24	-9

as compared to rural areas in various states viz. Andhra Pradesh, Bihar, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Tamil Nadu and West Bengal. Though the poverty level increased in all the states during 1962-68 and in some of the states during 1968-74, the maximum poverty was in 1968 in Andhra Pradesh, Haryana, Himachal Pradesh, Karnataka, Kerala, Punjab, and Tamil Nadu and in 1974 in other states. During 1974-78 poverty levels declined in most of the states except in Kerala and Punjab and increased again in 1978-83 in states other than Haryana, Himachal Pradesh, Kerala, Madhya Pradesh, Punjab and Tamil Nadu. The maximum poverty was experienced by Kerala in 1968 and was about 74%. This was lower than the rural maximum of 90% in Kerala (Table 5.2).

The poverty levels increased to a range of 16% to 62% in 1983. During 1961-83 Kerala poverty increased from 48 to 58%, Bihar from 26 to 62%, Tamil Nadu from 35 to 55%, Andhra Pradesh from 42 to 54%. Only two states viz. Haryana and Punjab registered a decline in poverty (Table 5.2). The urban poverty was lower than rural poverty in all the states except Punjab.

As in the rural areas, cities also displayed quite steady proportions in the expenditure class range of Rs. 30-40 and Rs. 40-50. The proportion of people below Rs. 30 and above Rs. 50 expenditure level varied quite substantially and inversely. In Himachal Pradesh, however, this income distribution behaved erratically.

The inter-state range for the Gini's coefficient was as wide as in the rural areas i.e. 0.26 to 0.37 in 1961-62. The value of the coefficient however was higher by about 25% in urban areas. Wider expenditure distribution in cities is indicated. The coefficient varied between 0.23 to 0.30 in 1983 in urban areas.

Average consumption expenditure of those who were poor increased slightly in 1983 as compared to 1961-62, even though these people could not rise above the poverty line. The mean expenditure of Andhra Pradesh and Gujarat though, declined over time.

Inter-state variations in the expenditure level of the poor were significant in 1961-62, ranging between Rs. 25 to Rs. 33, and they were just the same in 1983, i. e. between Rs. 26 to Rs. 34. A significant improvement materialized in the mean consumption of the poor in Madhya Pradesh, Orissa, Punjab and Tamil Nadu over 1961-62 to 1983.

Table 5.2

Inter-State Variations in Gini's Co-efficient Percent And Mean Expenditure  
of People with expenditure Below Rs. 30 at 1970-71 prices

Region: Urban

States	1961-62			1966-67			1970-71			1977-78			1983			Percentage Change 1983 over 1961-62	
	People %	Mean Expen.	Ginis coeff.	People %	Mean Expen.												
Andhra Pradesh	16	24.73	0.27	28	23.65	0.28	28	24.22	0.28	20	24.09	0.28	27	23.86	0.28	+11	-4
Bihar	8	25.22	0.37	26	23.08	0.29	25	24.22	0.30	34	23.74	0.26	37	23.86	0.25	+29	-5
Gujarat	4	18.87	0.26	21	24.18	0.24	17	25.31	0.22	9	26.58	0.27	15	26.03	0.23	+11	38
Haryana	N.A.	N.A.	N.A.	9	24.97	0.33	9	25.74	0.29	4	26.07	0.28	3	25.53	0.30	-6	2
Himachal Pradesh	N.A.	N.A.	N.A.	14	25.48	0.30	9	24.69	0.30	3	28.83	0.27	4	26.51	0.31	-10	4
Karnataka	11	22.40	0.31	33	23.44	0.26	29	24.79	0.27	24	24.97	0.27	26	23.88	0.30	+15	7
Kerala	30	21.08	0.35	54	20.44	0.38	54	21.34	0.35	53	19.61	0.37	41	22.75	0.36	+11	3
Madhya Pradesh	5	16.07	0.28	19	24.88	0.31	19	24.33	0.31	22	25.41	0.32	18	25.90	0.27	+13	61
Maharashtra	3	24.33	0.29	9	24.88	0.30	9	25.85	0.30	9	25.03	0.27	19	24.28	0.28	+16	0
Orissa	13	23.21	0.38	20	23.94	0.32	23	24.83	0.29	29	23.16	0.21	28	24.68	0.28	+15	6
Punjab	5	20.56	0.34	3	24.26	0.32	3	29.12	0.30	7	24.82	0.28	4	25.63	0.29	-1	25
Rajasthan	5	25.07	0.26	10	26.85	0.31	8	25.41	0.30	9	26.71	0.26	13	25.93	0.28	+8	3
Tamil Nadu	18	23.55	0.30	36	22.48	0.28	41	23.49	0.30	37	22.94	0.29	30	23.39	0.31	+12	-1
Uttar Pradesh	18	23.53	0.31	19	24.59	0.31	24	24.12	0.29	16	25.20	0.28	28	24.98	0.28	+10	6
West Bengal	6	24.35	0.29	12	25.03	0.28	18	24.79	0.30	23	24.12	0.28	22	24.15	0.29	+16	-1

CHAPTER 6DETERMINANTS OF INTER-STATE VARIATIONS IN POVERTY

Poverty germinates and is perpetuated because of certain factors such as the social customs, way of life, agro-climatic conditions and population growth. These forces are supposed to be counteracted by certain policy measures which may fail to carry weight and may in effect contribute to deepening of poverty. Input subsidies, for example, if maneuvered by the rich, may result in transfer of resources from the poor to the rich and thus lead to deepening of poverty. The study of causation attempts to bring out these influences. The study of state-specific determinants of poverty is important for a directed attempt towards removal of poverty. A very comprehensive analysis is required to accomplish this task. This study makes a preliminary attempt towards identifying certain determinants that could be analyzed in greater detail subsequently.

Eight variables, reflecting social and agro-economic forces in different states in rural areas are selected for a probe into the links between state poverty levels and these variables. These variables are:

- X1 : Per capita gross cropped area (1977-78)
- X2 : Per capita irrigated area (1977-78)
- X3 : Yield rate per hectare, food crops (average of 1975-76 to 1979-1980)
- X4 : Percentage of scheduled caste and scheduled tribe population. (1981)
- X5 : Enrollment rate to class VI-VIII: No. of students enrolled to class VI-VIII as percentage of population in the age group 11-14. (1979-80)  
This variable was preferred as compared to literacy rate. Willingness of parents to send their children to school at this age is an indication of their adoption of a dynamic attitude and a fair degree of awareness whereas literacy points to awareness alone.
- X6 : Percentage of holdings under marginal farmers (1977-78).
- X7 : Agricultural laborers as percentage of total agricultural workers. (1977-78).
- X8 : Percentage increase in population 1981 over 1961.
- Y : (dependent variable): Percentage of people below the poverty line (expenditure of Rs. 40 per month) in 1977-78.

Poverty levels were at a peak in most of the states in or around 1968, at the end of the three year, country-wide famine. Subsequent to these famine years, new agricultural technologies were adopted emphasising irrigation, high yielding variety seeds, fertilizers, etc. Some of the states, particularly wheat growing states, were quick to adopt these changes whereas rice growing states were rather slow. Sufficient time, thus, needs to be allowed, to let these forces have their play before assessing the impact of these variables on

levels of poverty. Since 1977-78 was the latest year in which complete NSSO data were available, this analysis is undertaken for the year 1977-78.

Table 6.1 presents the values of the dependent and independent variables, the simple correlation coefficients between variable (Y) and the variables X1 to X8, i.e. between percentage of persons below the poverty line with each of the explanatory variables, and multiple correlation between Y and X1 to X8.

The variables significantly but negatively correlated with level of poverty were per capita gross cropped area and per capita irrigated area. The increase in per capita gross cropped area and per capita irrigated area appears to lead to reduction in poverty.

Increase in per capita gross cropped area can be achieved through increasing area under cultivation and more so by going in for multiple-cropping. Adoption of multiple cropping in turn depends on usage of an input-package with less time consuming seeds and assured supply of water. Assured supply of water depends on irrigation, even in rain-fed areas of Bihar and West Bengal.

Poverty-levels in the rain-fed rice growing belt increased during the sixties and are almost maintained thereafter due to relative neglect of irrigation on a wide scale and consequent dependence on a single crop. The per capita irrigated area in Bihar is 0.07 hectares and in West Bengal 0.04 as compared to 0.46 in Punjab and 0.29 in Haryana. Multiple-cropping is a very recent phenomenon in these states yet to spread to small and marginal farmers.

The other variables are marginally linked with levels of poverty. A high yield rate per hectare goes towards reduction of the level of poverty. It is not strongly linked with poverty level because what leads to greatest impact is the interaction between level of yield rate and per capita gross cropped area. A high yield rate coupled with very small per capita area does not provide enough to counteract poverty. Kerala and Bihar for example have a high enough yield rate (next to Punjab only), but a very small per capita gross cropped area, and Madhya Pradesh, Orissa and Maharashtra, have a very low yield rate though sufficient area, and all these states have high levels of poverty. Punjab and Haryana on the other hand have high yield rates with sufficient gross cropped area per person and therefore low levels of poverty. Though yield rate itself did not come out to be a strong factor its interaction with per capita gross cropped area is a strong factor in the search for determinants of poverty.

Percentage of persons belonging to schedule castes or tribes is a social phenomenon effecting levels of poverty. The life style, environment, thought process and current low living standards of these people keep them poor. Any adverse development in the state influences them more and deepens their poverty. But a weak correlation (0.17) between level of poverty and percentage of persons in SC and ST category in 1977-78 indicates the breaking of these traditional factors.

Level of education is negatively though poorly correlated with level of poverty. A greater number of educated children, given other favorable factors, may result in reduction of poverty.

Table 6.1  
Values of Selected Variables and levels of Poverty by States

States	Levels of Poverty 1977-78	Per capita Gross crop-ped Area (hec.) 1977-78	Per capita Irrigated area (hec.) 1977-78	Yield Rate (kg.) per hectare (Food crops) 1975-76 to 1979-1980	SC & ST as % of total Population 1981	Enrollement to class VI-VII % of total in age group 11-14 1979-80	Percentage of holdings of under margin-al farmers 1976-77	Agricultural Labourers % to total Agri. work-ers 1976-77	Percentage increase in Population (1981 Over 1961)
Andhra Pradesh	55	0.32	0.11	991	21	21.4	47	53	48.9
Bihar	74	0.20	0.07	836	23	27.8	73	45	50.3
Gujarat	40	0.47	0.05	901	21	46.9	24	38	64.6
Haryana	18	0.57	0.29	1316	19	44.8	31	26	69.3
Himachal Pradesh	27	0.26	0.04	1198	29	62.4	55	4	50.7
Karnataka	56	0.43	0.07	954	20	45.2	33	31	57.0
Kerala	70	0.15	0.02	1497	11	88.6	26	43	50.3
Madhya Pradesh	79	0.51	0.06	607	37	30.8	47	37	61.1
Maharashtra	56	0.50	0.06	701	16	46.5	42	38	58.6
Orissa	78	0.35	0.06	769	37	29.2	30	11	49.7
Punjab	9	0.56	0.46	2276	27	59.0	65	52	47.7
Rajasthan	25	0.67	0.13	582	29	28.7	69	21	69.2
Tamil Nadu	71	0.25	0.12	1440	20	53.3	66	46	43.4
Uttar Pradesh	46	0.27	0.12	1033	21	36.8	88	68	50.3
West Bengal	71	0.21	0.04	1251	23	41.7	33	41	56.0
Multiple Correlation	0.9(1)	0.60*	0.53*	0.27	0.17	0.19	0.10	0.34	0.46*

Source: Basic: Statistics relating to Indian Economy: Vol. II: States Centre for Monitoring Indian Economy Sept. 1982 and 1985 Table 28.

\* Percentage of population with per capita per month expenditure below Rs. 40.

\* Significant at 5% level of significance.

(1) Multiple correlation.

The proportion of agricultural laborers in the rural work force also has a bearing on poverty levels. A positive though weak correlation indicates that a higher number of agricultural laborers may lead to increase of poverty in some states.

The relationship between population growth and levels of poverty comes out to be inverse and significant. The growth in population, therefore, does not appear to be an explanatory variable for inter-state variations in levels of poverty. The better off states seem to be experiencing relatively larger increases in population because of better levels of nourishment, in-migration due to employment opportunities, and various other factors.

Population increased around 50% in all the states in the last two decades. This sizable growth itself is a cause of increased poverty unless countered by increased production of foodgrains. In the low poverty states of Punjab, Haryana and Himachal Pradesh, the food production increased by 167% to 286%. In the high poverty states of Bihar, Kerala, Madhya Pradesh, Orissa, Tamil Nadu and West Bengal, the range of growth in foodgrain production was 14% to 42%. Besides milk production also increased in the low poverty states only. This divergence in production of food is one possible cause of inter-state variations in poverty (Table 6.2).

The multiple correlation between the dependent variable and the explanatory variables is 0.9 which is significant. Sufficiently large variations in levels of poverty can be explained by these factors.

Table 6.2

Percentage Increase in Production of Foodgrains  
(Average of 1981-82 to 1983-84 over Average of 1959-60 to 1961-62)

States	Percentage Increase in Production of Foodgrains early 1980's over early 1960's
Andhra Pradesh	70
Bihar	15
Gujarat	147
Haryana	167
Himachal Pradesh	212
Karnataka	75
Kerala	23
Madhya Pradesh	42
Maharashtra	55
Orissa	40
Punjab	286
Rajasthan	71
Tamil Nadu	14
Uttar Pradesh	91
West Bengal	36

Early Eighties : Average of 1981-82 to 1983-84.

Early Sixties : Average of 1959-60 to 1961-62.

Source: Basic statistics relating to the Indian Economy Volume 2.: States; September 1985; Centre for Monitoring Indian Economy.

ANNEXURE 1BIBLIOGRAPHY

This brief bibliography is in addition to the one annexed in Dr. Evenson's report on Food Consumption, Nutrient Intake and Agricultural Production in India, and primarily covers the referred articles and books.

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ANNEXURE 2DATA BASE AND METHODOLOGYI. Data Base

This study is based on the direct estimates of consumption expenditure of foodgrains and other articles made available by the National Sample Survey Organization (NSSO) since 1961. NSSO collects information on socio-economic variables on the basis of rounds, each round extending from a few months to over a year, using stratified multi-stage sampling design. Information on consumer expenditure was collected in all the rounds till the 28th round (1973-74), thereafter it was decided to collect this information every five years. The NSSO seeks to estimate all expenditures incurred by the household sector exclusively towards non-productive purposes. It includes consumption out of home grown produce, gifts, loans etc. Consumption here refers to non-productive expenditure incurred by the household during the reference of thirty days preceding the date of interview of the household. Data on monthly per capita consumer expenditure are presented by items of consumption, per capita expenditure classes, for all India and individual states for rural and urban areas separately. State-wise information is available from round 17 (61-62) except in round 19 (64-65) up to round 38 (1983).

A. Limitations of the NSSO Data for Analytical Purposes

The NSSO data, though uniform with respect to various concepts and definitions over time, still suffers from a few limitations stated below:

1. Period of enquiry in NSSO rounds ranges from a few months to over a year. It was from 14th round i.e. July 1958 - June 1959, that the period of enquiry was fixed to one year. The beginning of the round varied over the year.
2. The reference period in NSSO rounds is a moving period. The sample households are interviewed at different dates during the period of enquiry. This may produce a seasonality bias.
3. Number and structure of expenditure classes in NSSO rounds change over time. A re-arrangement of classes is required to make the data comparable.
4. Item coverage in NSSO rounds changed from time to time, necessitating a reclassification to general consistent time series for these items over the study period.
5. Difficult and complicated sampling design adopted by NSSO renders the computation of the standard error of the estimates difficult. Therefore conventional statistical tests of significance of various estimates is not possible.

6. The NSSO estimates of aggregates and distribution are affected by the particular method of consumption valuation. The NSSO values consumption out of cash purchases at actual purchase price, that out of home grown stock at ex-farm price and that out of barter and transfers at the average retail prices. The proportion of purchased articles to home grown consumption differs from class to class and year to year, and also prices actually paid by each class, place and year are different. This valuation procedure leads to inter-class and inter-regional price variations. This renders any selected price indices inappropriate for deflation of these expenditures for inter-temporal and inter-state comparisons.

## II. Construction of Appropriate Deflators

The NSSO provides estimates of per capita expenditure by items of consumption and by per capita expenditure classes in every round at current prices. These expenditures need to be expressed at the same constant prices to be of any comparative use. The procedure of valuation of quantitative consumption is such that the actual recorded prices tend to vary over expenditure classes, states and places. The relative changes in prices of food items, too vary over the years.

In view of this, the task of constructing appropriate price indices to deflate these expenditures is formidable. The complications involved motivated quite a few researchers to bypass the requirement. They, instead preferred to adopt fractile analysis with expenditures at current prices and express the results as bottom X% of population incurring Y% of expenditure in year 1, 2 and so on. A comparison of  $Y_1\%$  with  $Y_2\%$  then provides the required over-time change.

The adequacy of this approach is put to stake by inter-class variations in prices. The relative expenses of the X% of population in real terms are likely to be at variance with their expenses in monetary terms. Fractile analysis, in fact, is a mechanism to regularise the unequal and irregular classes. A realistic, comparative picture over time emerges with the fractile analysis applied to real expenses only. This places an added importance on formation of appropriate deflators.

Montek Ahluwalia (1986) and Uma Dutta Chaudhry (1966) deflated the per capita expenditures incurred by each decile before estimating poverty. A tacit assumption of an income-distribution unaffected by price changes is thereby made. The NSSO data reveal that the prices paid by the poorer classes are lower by as much as 30% in almost all the states. The income distribution in real terms is, thus, different from income distribution in monetary terms.

NSSO round 17, 27, 28 & 32, per capita expenditure estimates of eight major cereals, total cereals, pulses and grams by per capita expenditure classes are presented in monetary values as well as in quantities. Based on this information, average and class-wise NSSO prices were calculated. On examination, these prices revealed the following types of variation:

- (i) Price changes over time
- (ii) Price changes over classes
- (iii) Price changes over states including rural/urban variations
- (iv) Price changes over commodities

Introduced price adjustment factors should take account of these variations.

Wholesale price indices in India provide the most consistent and extensive series of price indices. Other available indices like Consumer Price Indices for Agricultural Labourers (CPIAL) and Cost of Living Indices for Industrial Workers are class-specific. Besides, the divergence between the Consumer Price Indices of Agricultural Labourers and the NSSO implicit price indices based on foodgrains is consistently greater than the divergence between the wholesale price indices and the implicit NSSO price indices. The usage of CPIAL, therefore, is not considered appropriate. The use of wholesale price indices, with suitable adjustment factors for inter-class price variations and adapted to state specific NSSO implicit price indices, is considered to be the most appropriate deflator.

#### A. Formulation for the Deflators

Let  $i$  denote the commodities of NSSO data  
 $r$  denote the rounds of NSSO  
 $c$  denote the per capita expenditure classes  
 $j$  denote the state i.e. Rural and Urban for the fifteen study states.  
 Let

$I_{ri}$  be the wholesale price index for round  $r$  and commodity  $i$  on the selected base 1970-71

$R_{cj}$  be the inter-class price ratio for state  $j$  class  $c$  averaged over  $r$  and  $i$

$K_{rj}$  be the ratio of NSSO price indices to wholesale price indices for round  $r$  and state  $j$  averaged over cereals and pulses.

Then, the required deflators are given by:

$$D_{rijc} = I_{ri} \times R_{ij} \times K_{rj}.$$

NSSO Prices for per capita expenditure classes and average of all expenditure classes for foodgrains, cereals and pulses were used to obtain  $R_{cj}$  and  $K_{rj}$ .

#### B. Formulation of Inter-Class Adjustment Factors

Let

$V_{rijc}$  be the value of expenditure (Rs.) on commodity  $i$  by class  $c$  in round  $r$  and state  $j$ .

$Q_{rijc}$  be the quantity consumed in kg. of commodity  $i$  by class  $c$  in round  $r$  and state  $j$ .

Then

$$P_{rijc} = \frac{V_{rijc}}{Q_{rijc}} = \text{Price of commodity } i \text{ paid by class } c \text{ in round } r \text{ and state } j$$

$P_{rij} = \frac{V_{rij}}{Q_{rij}}$  = Average price of commodity i in round r and state j.

$R_{rijc} = \frac{P_{rijc}}{P_{rij}}$  = Ratio of price of commodity i paid by class c to average Price of that commodity in round r state j.

$$R_{icj} = \frac{\sum_r R_{icj}}{\text{No. of Rounds}}$$

$$R_{cj} = \frac{\sum_i R_{icj} V_{27icj}}{\sum_i V_{27icj}}$$

$R_{cj}$  are the inter-class adjustment factors to be used for rounds 17-28 for all commodities.  $R_{cj}$ 's calculated from cereals and pulses are assumed to hold good for all other commodities, the quantity data for which were not available. Table A 2.1 and A 2.2 give the estimated inter-class adjustment factors.

Prices paid by the open ended class were observed to change substantially when that class was closed and a new open ended class formed. Therefore an average adjustment factor was worked out for all the classes formed by breaking the earlier open ended classes.

The class structure of round 32 and 38 is altogether different from the earlier rounds. Inter-class price ratios for round 32 therefore, are based on this round itself. For round 38, the inter class price ratios are based on the weighted average of the ratios of matching classes of round 32 (Tables A 2.3 to A 2.6).

### C. Formulation of Ratio of NSSO to Wholesale Prices

On the basis of average NSSO prices of cereals and pulses, price relatives were computed with 1972-73 as the base for every round for which the NSSO prices could be computed. 1972-73 was selected as the base for this purpose as quantity data and hence prices for the 1970-71 round were not available. These price relatives were compared with wholesale price indices for corresponding years with the base as 1972-73. The ratio of NSSO prices to wholesale prices was computed for each of these rounds. These ratios averaged over commodities were used as adjustment factors to wholesale price indices for the respective rounds. For the remaining rounds an average of these ratios over all the rounds was used (Tables A 2.7 & A 2.8).

Formulation

Let

$L_{rij} = \frac{P_{rij}}{P_{27ij}}$  be the price relative of average NSSO prices of cereals and pulses in round r to that in round 27.

Table A 2.1

State Wise Inter-Class Ratios  
(For rounds 17-23)

<u>Per Capita Expenditure Classes</u>	Rural														
	AP	BI	GJ	HA	HP	KA	KE	MP	MA	OR	FU	RA	TN	UP	W.B.
0-8	0.84	0.80	0.79	0.90	0.84	0.82	0.85	0.84	0.84	0.92	0.95	0.86	0.92	0.92	0.95
8-11	0.84	0.80	0.79	0.90	0.84	0.82	0.85	0.84	0.84	0.92	0.95	0.86	0.92	0.92	0.95
11-13	0.84	0.80	0.79	0.90	0.84	0.82	0.85	0.84	0.84	0.92	0.95	0.86	0.92	0.92	0.95
13-15	0.84	0.80	0.79	0.90	0.84	0.82	0.90	0.84	0.84	0.92	0.95	0.86	0.92	0.95	0.96
15-18	0.89	0.80	0.88	0.90	0.84	0.84	0.90	0.91	0.84	0.96	0.95	0.86	0.92	0.95	0.96
18-21	0.92	0.83	0.91	0.90	0.84	0.90	0.91	0.93	0.84	0.96	0.95	0.86	0.93	0.96	0.98
21-24	0.93	0.87	0.95	0.94	0.90	0.90	0.93	0.93	0.84	0.96	0.95	0.93	0.95	0.96	0.98
24-28	0.98	0.90	0.96	0.94	0.90	0.92	0.96	0.96	0.93	0.99	0.96	0.95	0.95	0.96	0.99
28-34	0.98	0.92	0.99	0.95	0.90	0.96	0.96	0.97	0.93	1.00	0.96	0.97	0.99	0.96	0.99
34-43	1.02	0.97	1.00	0.96	0.90	1.03	0.96	1.01	1.00	1.03	1.01	0.98	1.00	1.00	0.99
43-55	1.04	1.01	1.01	0.98	0.96	1.04	0.96	1.07	1.00	1.09	1.02	1.02	1.02	1.00	1.03
55-75	1.10	1.05	1.09	1.00	1.01	1.12	0.99	1.07	1.14	1.10	1.02	1.02	1.07	1.04	1.04
75-100	1.10	1.06	1.18	1.01	1.03	1.12	1.12	1.07	1.14	1.10	1.02	1.07	1.07	1.04	1.04
100-150	1.10	1.06	1.18	1.04	1.08	1.12	1.12	1.07	1.14	1.10	1.02	1.07	1.07	1.04	1.04
150-200	1.10	1.06	1.18	1.04	1.08	1.12	1.12	1.07	1.14	1.10	1.02	1.07	1.07	1.04	1.04
200 & above	1.10	1.06	1.18	1.04	1.08	1.12	1.12	1.07	1.14	1.10	1.02	1.07	1.07	1.04	1.04
Average	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
% Change Last Class over Ist Class	31	32	49	16	29	37	32	27	36	20	7	24	16	13	10

Table A 2.2

State Wise Inter-Class Ratios  
(For rounds 17-28)

Urban

<u>Per Capita Expenditure Classes</u>	AP	BI	GU	HA	HP	KA	KE	MP	MA	OR	FU	RA	TN	UP	W.B.
0-8	0.88	0.84	0.88	0.92	0.88	0.85	0.85	0.86	0.73	0.91	0.90	0.81	0.90	0.85	0.90
8-11	0.88	0.84	0.88	0.92	0.88	0.85	0.85	0.86	0.73	0.91	0.90	0.81	0.90	0.85	0.90
11-13	0.88	0.84	0.88	0.92	0.88	0.85	0.85	0.86	0.73	0.91	0.90	0.81	0.90	0.85	0.90
13-15	0.88	0.84	0.88	0.92	0.88	0.88	0.90	0.86	0.73	0.94	0.90	0.81	0.93	0.85	0.90
15-18	0.91	0.84	0.90	0.94	0.88	0.88	0.90	0.90	0.73	0.94	0.90	0.81	0.93	0.89	0.90
18-21	0.92	0.84	0.90	0.95	0.88	0.92	0.91	0.90	0.83	0.94	0.93	0.82	0.93	0.89	0.90
21-24	0.93	0.84	0.90	0.95	0.88	0.92	0.93	0.94	0.83	0.94	0.93	0.86	0.93	0.90	0.90
24-28	0.95	0.87	0.90	0.95	0.88	0.95	0.96	0.94	0.86	0.95	0.96	0.88	0.93	0.94	0.93
28-34	0.97	0.90	0.90	0.95	0.88	0.95	0.96	0.95	0.90	0.95	0.96	0.93	0.97	0.95	0.93
34-43	1.00	0.93	0.96	0.96	0.88	0.95	0.96	1.02	0.95	0.98	0.98	0.96	0.98	0.99	0.97
43-55	1.02	1.00	0.99	0.99	0.94	1.01	0.96	1.08	1.03	0.98	0.98	1.00	1.07	1.04	0.99
55-75	1.07	1.01	1.05	1.01	0.97	1.06	0.99	1.08	1.09	1.03	0.98	1.01	1.07	1.07	1.03
75-100	1.07	1.08	1.17	1.03	0.98	1.16	1.12	1.08	1.14	1.06	1.01	1.08	1.07	1.07	1.03
100-150	1.07	1.08	1.17	1.03	1.00	1.16	1.12	1.08	1.14	1.06	1.03	1.08	1.07	1.07	1.03
150-200	1.07	1.08	1.17	1.05	1.05	1.16	1.12	1.08	1.14	1.06	1.03	1.08	1.07	1.07	1.03
200 & above	1.07	1.08	1.17	1.12	1.05	1.16	1.12	1.08	1.14	1.06	1.03	1.08	1.07	1.07	1.03
Average	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
% Change Last class Over Ist Class	22	29	33	14	27	36	32	26	56	16	14	33	19	26	14





Table A 2.5

State Wise Inter-Class Ratios  
(For round 38)

Rural

<u>Per Capita Expenditure Classes</u>	AP	BI	GU	HA	HP	KA	KE	MP	MA	OR	PU	RA	TN	UP	W.B.
0-30 (1)	0.73	0.92	0.72	0.93	0.82	0.77	0.89	0.81	0.72	0.90	0.96	0.76	0.79	0.81	0.93
30-40 (2)	0.86	0.92	0.83	0.97	0.94	0.84	0.92	0.92	0.83	0.95	0.96	0.92	0.89	0.89	0.96
40-50 (3)	0.91	0.95	0.90	0.99	0.96	0.91	0.95	0.96	0.90	0.98	1.00	0.98	0.90	0.93	0.98
50-60 (3)	0.94	0.97	0.95	0.99	0.99	0.92	0.96	0.98	0.90	0.99	1.00	0.98	0.95	0.98	0.99
60-70 (3)	0.98	0.99	0.97	1.00	0.99	0.99	0.96	1.00	0.97	1.00	1.00	1.02	0.96	1.02	1.01
70-85 (4)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	1.02	0.96	1.02	1.03
85-100(4)	1.00	1.02	1.00	1.00	1.00	1.01	1.00	1.00	1.00	1.02	1.00	1.02	1.00	1.02	1.03
100-125(5)	1.04	1.03	1.04	1.02	1.04	1.13	1.00	1.00	1.05	1.02	1.00	1.02	1.03	1.02	1.04
125-150(5)	1.04	1.03	1.04	1.02	1.04	1.13	1.00	1.00	1.05	1.02	1.00	1.02	1.03	1.02	1.04
150-200(3)	1.04	1.07	1.09	1.02	1.07	1.15	1.00	1.02	1.05	1.02	1.02	1.08	1.05	1.02	1.06
200-250(6)	1.04	1.07	1.09	1.02	1.07	1.15	1.11	1.04	1.05	1.02	1.02	1.08	1.05	1.02	1.06
250-300(6)	1.04	1.07	1.09	1.02	1.08	1.15	1.11	1.04	1.05	1.02	1.02	1.08	1.05	1.02	1.06
300 & above (6)	1.04	1.07	1.09	1.02	1.08	1.15	1.11	1.04	1.05	1.02	1.02	1.08	1.05	1.02	1.06
Average	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
% Change Last Class Over Ist Class	42	16	51	10	32	49	25	28	46	13	6	42	33	26	14

(1) Weighted average of the class ratios of round 32 classes 0-10, 10-15, and 20-30.

(2) Weighted average of the class ratios of round 32 classes 30-35 and 35-40.

(3) As in comparable classes of round 32.

(4) As in class 70-80 and 80-100 of round 32.

(5) As in class 100-150 of round 32.

(6) As in class 200 and above of round 32.

(7) Class ratios in round 38 as obtained on the b

Table A 2.6

State Wise Inter-Class Ratios  
(For round 38)

Urban

<u>Per Capita Expenditure Classes</u>		AP	BI	GU	HA	HP	KA	KE	MP	MA	OR	PU	RA	TN	UP	W.B.
0-30	(1)	0.89	0.85	0.89	1.00	0.88	0.73	0.93	0.81	0.70	0.87	0.92	0.84	0.84	0.88	0.89
30-40	(2)	0.89	0.89	0.90	1.00	0.90	0.78	0.97	0.89	0.76	0.91	0.93	0.92	0.90	0.89	0.91
40-50	(3)	0.92	0.92	0.91	1.00	0.94	0.82	0.98	0.90	0.83	0.94	0.94	0.94	0.93	0.90	0.95
50-60	(3)	0.97	0.94	0.95	1.00	0.94	0.86	1.00	0.95	0.84	0.96	0.94	0.94	0.95	0.93	0.96
60-70	(3)	0.98	0.96	0.99	1.00	0.95	0.91	1.00	0.97	0.94	1.00	0.96	0.97	0.97	0.96	0.97
70-85	(4)	0.99	0.98	0.99	1.00	0.98	0.95	1.00	1.00	0.97	1.00	0.96	0.97	0.98	0.96	0.97
85-100	(4)	1.00	1.02	1.00	1.00	1.06	1.00	1.02	1.02	1.00	1.04	0.97	1.00	1.00	0.97	1.00
100-125	(5)	1.03	1.04	1.04	1.00	1.06	1.04	1.02	1.02	1.08	1.04	1.07	1.05	1.03	1.04	1.05
125-150	(5)	1.03	1.04	1.04	1.00	1.06	1.04	1.02	1.02	1.08	1.04	1.07	1.05	1.03	1.04	1.05
150-200	(3)	1.05	1.11	1.08	1.00	1.07	1.07	1.02	1.05	1.08	1.04	1.07	1.07	1.05	1.05	1.09
200-250	(6)	1.05	1.11	1.08	1.00	1.07	1.07	1.02	1.05	1.23	1.04	1.07	1.07	1.08	1.05	1.09
250-300	(6)	1.05	1.11	1.08	1.00	1.08	1.07	1.02	1.05	1.23	1.04	1.07	1.07	1.08	1.05	1.09
300 & above	(6)	1.05	1.11	1.08	1.00	1.08	1.07	1.02	1.05	1.23	1.04	1.07	1.07	1.08	1.05	1.09
Average		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
% Change Last Class Over Ist Class		18	31	21	0	23	47	10	30	76	20	16	27	29	19	22

- (1) Weighted average of the class ratios of round 32 classes 0-10, 10-15, and 20-30.
- (2) Weighted average of the class ratios of round 32 classes 30-35 and 35-40.
- (3) As in comparable classes of round 32.
- (4) As in class 70-80 and 80-100 of round 32.
- (5) As in class 100-150 of round 32.
- (6) As in class 200 and above of round 32.
- (7) Class ratios in round 38 as obtained on the basis of round 32, as mentioned in notes (1) to (6), were modified equating the ratio of class 70-85 or 85-100 to 1.00.

$$\text{Then } K_{rij} = \frac{L_{rij}}{I_{ri}} \times \frac{P_{27ij}}{P_{27i}}$$

$r = 17, 27, 28, 32$  for all cereals and pulses.

$$K_{rj} = \frac{\sum K_{rij} \cdot V_{27ij}}{\sum V_{27ij}} \quad \text{for all cereals and pulses.}$$

Where  $P_{27i}$  is the all India Wholesale Price of cereals and pulses for the year corresponding to 27th round i.e. 1972-73.

$K_{rj}$  are the required adjustment factors used for all commodities.

$$K_j = \frac{\sum_r K_{rj}}{\text{No. of rounds}}$$

for  $r$  other than above.

The state-All India price variations exist not only in the rate of change in prices over the years but also in the level of operative prices. The factor  $L_{rij}/I_{ri}$  takes care of the variation in the rate of change and the factor  $P_{rij}/P_{ri}$ , the ratio of state NSSO prices to All India prices, takes care of the variations in the level of prices.

Per capita food expenditure in real terms is a simple sum of the estimated deflated per capita expenditures of the individual food items. Per capita non-food expenditures are deflated by weighted price indices of all items and food items.

$$I_{rNF} = \frac{I_r - 0.7 \cdot I_{rf}}{0.3}$$

where  $I_{rNF}$  are the price indices of non-food items  
 $I_{rf}$  are the price indices of total of food items  
 $I_r$  are the price indices of all consumer items

Expenditure ratio on food to non-food items was calculated from NSSO data.

Per capita deflated expenditures on all items were obtained by summing up deflated expenditure on food and non-food items.

### III. Nutrition Estimates

Nutrition estimates were obtained from the per capita expenditure on food items at constant prices following two steps.

Table A 2.7

NSS to wholesale Price Ratio

Rural

<u>Round</u>	AP	BI	GU	HA	HP	KA	KE	MP	MA	OR	PU	RA	TN	UP	W.B.
17	0.90	0.90	0.77	-	-	0.78	1.09	0.69	0.80	0.79	0.71	0.60	0.93	0.72	1.02
18	0.90	0.96	0.88	0.73	0.85	0.91	1.15	0.84	0.88	0.86	0.67	0.72	0.89	0.77	1.01
20	0.90	0.96	0.88	0.73	0.85	0.91	1.15	0.84	0.88	0.86	0.67	0.72	0.89	0.77	1.01
21	0.90	0.96	0.88	0.73	0.85	0.91	1.15	0.84	0.88	0.86	0.67	0.72	0.89	0.77	1.01
22	0.90	0.96	0.88	0.73	0.85	0.91	1.15	0.84	0.88	0.86	0.67	0.72	0.89	0.77	1.01
23	0.90	0.96	0.88	0.73	0.85	0.91	1.15	0.84	0.88	0.86	0.67	0.72	0.89	0.77	1.01
24	0.90	0.96	0.88	0.73	0.85	0.91	1.15	0.84	0.88	0.86	0.67	0.72	0.89	0.77	1.01
25	0.90	0.96	0.88	0.73	0.85	0.91	1.15	0.84	0.88	0.86	0.67	0.72	0.89	0.77	1.01
27	0.92	1.04	0.99	0.75	0.86	1.01	1.29	0.79	0.98	0.91	0.62	0.81	0.82	0.77	1.08
28	0.92	1.32*	0.98	0.74	0.91	1.03	1.55*	0.91	1.01	0.85	0.66	0.79	0.92	0.88	1.31*
32	0.87	0.93	0.78	0.70	0.78	0.79	1.05	0.98	0.73	0.88	0.70	0.66	0.90	0.70	0.93
38	0.90	0.96	0.88	0.73	0.85	0.91	1.15	0.84	0.88	0.86	0.67	0.72	0.89	0.77	1.01
Average	0.90	0.96	0.88	0.73	0.85	0.91	1.15	0.84	0.88	0.86	0.67	0.72	0.89	0.77	1.01

\* 1) Figure being abnormal was excluded from calculation of average.

Table A 2.8

NSS to wholesale Price Ratio

Urban

<u>Round</u>	AP	BI	GU	HA	HP	KA	KE	MP	MA	OR	PU	RA	TN	UP	W.B.
17	1.02	0.99	1.01	-	-	0.96	1.11	0.79	1.03	0.96	0.83	0.79	1.10	0.94	1.07
18	1.04	1.08	1.04	0.78	0.99	1.04	1.18	0.89	1.01	0.99	0.79	0.84	1.06	0.91	1.05
20	1.04	1.08	1.04	0.78	0.99	1.04	1.18	0.89	1.01	0.99	0.79	0.84	1.06	0.91	1.05
21	1.04	1.08	1.04	0.78	0.99	1.04	1.18	0.89	1.01	0.99	0.79	0.84	1.06	0.91	1.05
22	1.04	1.08	1.04	0.78	0.99	1.04	1.18	0.89	1.01	0.99	0.79	0.84	1.06	0.91	1.05
23	1.04	1.08	1.04	0.78	0.99	1.04	1.18	0.89	1.01	0.99	0.79	0.84	1.06	0.91	1.05
24	1.04	1.08	1.04	0.78	0.99	1.04	1.18	0.89	1.01	0.99	0.79	0.84	1.06	0.91	1.05
25	1.04	1.08	1.04	0.78	0.99	1.04	1.18	0.89	1.01	0.99	0.79	0.84	1.06	0.91	1.05
27	1.08	1.15	1.08	0.82	1.03	1.18	1.32	0.89	1.04	1.01	0.76	0.87	1.06	0.91	1.05
28	1.06	1.44*	1.15	0.81	1.04	1.11	1.13	1.02	1.06	1.00	0.78	0.88	1.08	1.03	1.32
32	1.00	1.07	0.93	0.72	0.90	0.93	1.15	0.87	0.91	1.00	0.79	0.81	1.09	0.80	1.00
38	1.04	1.08	1.04	0.78	0.99	1.04	1.18	0.89	1.01	0.99	0.79	0.84	1.06	0.91	1.05
Average	1.04	1.08	1.04	0.78	0.99	1.04	1.18	0.89	1.01	0.99	0.79	0.84	1.06	0.91	1.05

\* 1) Figures not included for being abnormal

- (i) The real per capita expenditures in terms of 1970-71 prices of foodgrains, cereals, pulses and other food articles were divided by their respective wholesale prices in 1970-71 to get the quantity estimates. Table A 2.9 gives the prices of food items at 1970-71 prices.
- (ii) These quantity estimates were subjected to standard nutritive value conversion factors from the National Institute of Nutrition (Table A 2.10) to estimate the per capita intake of calories and protein.

#### IV. Definition of Poverty

The poor, in this study are indentified as those persons whose calorie intake is less than the ICMR recommended intake of 2,150 kcal per day. The expenditure 'equivalent' of this calorie norm at 1970-71 prices has been worked out at Rs. 40 as follows:

Considering that 60% of total expenditure is spent on calorie giving food (Proportion of total expenditure on food is 70% and of this 85% is on calorie giving food) and assuming that this food consists of foodgrains only the 'equivalent' expenditure is

$$\frac{2150}{347} \times 1.27 \times \frac{100}{60} \times 30 = \text{Rs. 40}$$

Rs. 1.27 is the price of 1 kg. foodgrain at 1970-71 prices and which contains 347 kcal per 100 grams.

#### V. Fractile Analysis

Inter-temporal comparison of NSSO estimates is obstructed by frequent changes in the class structure of per capita expenditures in NSSO data. Fractile analysis provides a methodology for conversion to a uniform class pattern. Fractile groups are obtained by arranging the sample households in ascending order of per capita expenditure and then dividing them into a suitable number of groups of equal population size from the bottom. The present study, however, considers the usage of number of sample persons instead of sample households as a more meaningful measure for a study of per capita expenditures. This study attempts to estimate the proportion of total expenditure, upper terminal value and average value of per capita expenditure by fractile groups (deciles). It also attempts to provide these estimates for various subheads like expenditures on food items, total of food and total of non-food. Intake of calories and protein is also estimated by deciles.

Annexure II of the report entitled 'Food Consumption, Nutrient Intake and Agricultural Production in India' by R.E. Evenson prepared for USAID in 1986 describes the procedure of fractile analysis in detail and indicates the modifications required for the analysis of NSSO data. The formula for Gini ratio and Sen's index of poverty are also included in the Evenson report.

Table A 2.9  
Prices of Food Items at 1970-71 Prices

Food Items	1970-71 Prices per kg. (Rs.)
Rice	1.35
Wheat	1.06
Jawar	0.82
Bajra	0.76
Barley	0.65
Maize	0.68
Ragi	0.65
Sm. Millets	0.68
Grams	1.08
Cereals Substitutes	0.68
Cereals (a)	1.14
Pulses	1.56
Milk	1.16
Edible oils	5.33
Meat, egg and fish	5.12
Vegetable and fruits	1.11
Sugar	1.97
Salt and spices	0.19
Beverages	0.16
Food grains (a)	1.27

(a) computed by using weights assigned to individual commodities in wholesale price indices.

Table A 2.10  
Nutrient contents of Food Items

Food Items	Kilo Calories (Per 100 gms.)	Protein (Per 100 gms.)
Rice	346	7.5
Wheat	346	11.8
Bajra	361	11.6
Jawar	336	10.4
Barley	336	11.5
Maize	342	11.1
Ragi	328	7.3
Grams	360	17.1
Cereals	338	9.6
Pulses	349	23.3
Foodgrains (a)	339	10.8
Edible oils	900	0.0
Milk	83	3.8
Fruits and vegetables	69	2.9
Meat, egg and fish	150	18.0
Sugar	398	0.1

(a) Weighted average of cereal and pulse calorie and protein content

Source:

1. Hand Book of Food and Nutrition Statistics by Food and Nutrition Board, Ministry of Agriculture, Govt. of India.
2. Nutritive Value of Indian Foods, by Gopalan C. Rama Sastri, B.V. and Balasubramanian, National Institute of Nutrition.