

CONSUMPTION AND WELFARE

A good deal of information on household consumption expenditure was collected by comparable methods in the National Sample Survey (N.S.S.) in the form of 'rounds' of survey, year by year, for many years. The aggregate value of consumption per person* of a household may be used as an approximate indicator of the level of living of the household. For any given round of the N.S.S., it is possible to arrange the sample households in ascending order of the aggregate value of the total per capita consumption expenditure per month**; such ordering would correspond approximately to increasing levels of living. The sample households can then be divided into a suitable number of groups of equal size*** from the bottom. If, say, ten equal groups each of ten per cent (*i.e.*, ten decile groups) are used, then the bottom ten per cent would represent the poorest section of the people, and the top ten per cent the richest households. A comparison of the consumption in physical terms, or in money terms, of particular items, or of all items of goods or services, for the ten different decile groups would supply information about disparities in the level of living between the ten decile groups.

Comparison Over Time: Detailed information on the consumption of a number of goods and services has been tabulated for seven rounds of the National Sample Survey. It is possible, in principle, to examine whether there has been any change, over time, in the distribution by size of particular items of consumption, during this period. In the case of expenditure on consumer goods and services, such comparisons over time would be meaningful only if all prices had remained the same or had changed in the same proportion. In fact, prices had changed continually. Conversion of all these prices into a standard constant price involved great technical difficulties, adequate information for this purpose is also not available. No attempt has, therefore, been made to study the distribution by size of expenditure at constant prices. One way of getting over the difficulty, at least partially, of making adjustments for changes in prices would be to consider, not the actual expenditure of different fractile groups but, the relative share of expenditure.

*Or, in ascending order of aggregate consumption expenditure per household as a whole. Results valid for the two types of ranking would be valid for ranking by any scale of adult equivalents.

**In the National Sample Survey, estimates are usually given for a 'standard month of 30 days'.

***That is, containing an equal number of persons of the estimated population; such groups of equal size are called 'fractile groups', in the terminology used in Fractile Graphical Analysis (F.G.A.).

Concentration Curves: By plotting on a graph paper the cumulative percentage shares of consumer expenditure against successive decile groups, it is possible to obtain the concentration curve for the distribution of consumer expenditure over fractile groups. If the distribution is equal, that is, in the purely hypothetical case when each person (or household) has exactly the same per capita expenditure, the concentration curve would be the same as the diagonal line at an angle of 45° with both the axes. In this case, if we continue to add the successive consumption expenditure of each person (or household), the accumulated sum of such expenditure would be exactly the expenditure of each person (or household), multiplied by the number of persons (or households). Therefore, the cumulative percentage share of total expenditure would be the same as the cumulative percentage of persons; all the points would then fall on the diagonal line mentioned above. The nearer the observed concentration curve is to this diagonal line of equal distribution, the greater will be the equality of distribution. Also, the farther away the observed concentration curve is from the diagonal line, the greater will be the inequality of distribution.

Rise in the Price of Cereals: The price of cereals was at its lowest level in rounds 8 and 9, and at the highest level in rounds 15 and 16. Relevant information on the respective price index number, period of survey, and the number of households (with about half the number in each subsample) which were covered in the survey in each of N.S.S. rounds 8, 9, 15 and 16, are given below:

STATEMENT I

N.S.S. Rounds, Period of Survey, Price Index of Cereals,
and Number of Households in Combined Sample

<i>N.S.S. round</i>	<i>Price index of cereals 1952-53 price=100</i>	<i>Period of survey</i>	<i>Number of households</i>
8	77.4	July 1954-March 1955	1,833
9	73.3	May 1955-November 1955	1,600
15	105.6	July 1959-June 1960	7,144
16	103.2	July 1960-June 1961	3,703

It would be seen that the price index numbers for cereals were very low, 77.4 and 73.3 (with 1952-53 price = 100), in rounds 8 and 9; the index number increased to 105.6 in 1959-60, and was slightly lower, 103.2, in 1960-61. The general increase in the prices of cereals was about 45 per cent between 1954-55 and 1959-61. The period covered by survey rounds 8 and 9 with low prices, on the one hand, and the period covered by rounds 15 and 16 with high prices on the other, therefore, supply suitable data for the study of the effect of increase in prices on the consumption of cereals.

Index numbers of average prices of cereals in rounds 15 and 16, taken together, with corresponding prices in rounds 8 and 9, taken together, (base = 100) are shown in the Statement II. Decile groups are shown in column (1) — and the corresponding index numbers are given, separately, for sub-sample 1(s.s.1), sub-sample 2 (s.s.2), and the combined sample* in columns (2), (3) and (4), respectively, in the Statement II. Differences between the two estimates for sub-sample 1 and sub-sample 2 supply information on the margin of uncertainty of the estimates for the combined sample inclusive of both sampling and non-sampling errors. The index numbers are shown in a graphical form in Chart 1. It can be seen from the bottom line of the Statement II that the Index number for the whole (that is, 0 to 100 per cent) of the population was 145 showing that the general rise in prices of cereals was 45 per cent. For the lowest decile, or bottom 10 per cent of the population, index numbers, as shown in line 1, were of the order of 180 or 190, indicating that the price of cereals increased by 80 or 90 per cent in the case of the poorest section of the population. Index numbers for the second, third, and fourth deciles

STATEMET II

Index Number of Average Price of Cereals in N.S.S. Rounds (15, 16)
with Price in Rounds (8, 9) As Base=100, By Fractile Groups, All-
India Rural

<i>Fractile group (per cent)</i>	<i>s.s. 1</i>	<i>s.s. 2</i>	<i>combined</i>
0—10	178	191	183
10—20	165	162	159
20—30	158	154	158
30—40	161	151	158
40—50	154	142	149
50—60	143	141	144
60—70	138	149	145
70—80	138	139	139
80—90	135	141	137
90—100	123	137	129
0—100	145	145	145

were appreciably lower and the rise in prices was of the order of somewhat less than 60 per cent. For the fifth decile (line 5), the rise was of the order of 50 per cent. The percentage increase of prices gradually dropped in higher deciles, and was of the order of only 30 per cent in the tenth decile for the top 10 per cent of the population. The increase in the

*The information in the National Sample Survey was collected in the form of at least two (and sometimes, more) inter-penetrating net-work of samples (I.P.N.S.). These two samples are statistically independent and equivalent, and are called the two sub-samples (s.s. 1 and s.s. 2); pooling them together one gets the combined sample, that is, the sample as a whole.

price of cereals was thus relatively much greater for the poorer sections of the people.

In order to maintain the consumption of cereals at the same physical level, the increase in expenditure on cereals of poorer households would have to be relatively much larger than the increase of expenditure on cereals of the richer people. For example, the bottom 10 per cent, or the poorest section of the population would have to incur in rounds (15 and 16) something of the order of 80 per cent more expenditure, and the top 10 per cent of the population only about 30 per cent more expenditure on cereals, in comparison with their respective expenditure on cereals in rounds (8 and 9), in order to keep the per capita consumption of cereals in rounds (15 and 16) the same in physical terms as in rounds (8 and 9).

Changes in Shares of Cereals Consumption: Because the actual expenditure on cereals of the poorer households would have to be relatively greater in rounds (15 and 16), in order to keep the level of consumption the same in physical terms, the share of expenditure of the poorer sections would also be relatively greater in rounds (15 and 16) in comparison with their share of expenditure in rounds (8 and 9). The cumulative proportion of the population and the accumulated share of expenditure from the bottom decile would also be higher for each decile upto the ninth decile, and would become 100 per cent in the tenth decile, that is, for the population as a whole. Relevant data for consumption of cereals in rural areas in India are given in Statement III, in which column (2) shows the cumulative percentage of population from the bottom.

The cumulative shares of the quantity of cereals consumed upto each fractile group in rounds (3 and 9) are shown in column (3), and in rounds (15 and 16) are shown in column (4). The cumulative shares of the value of the cereals consumed, that is, the cumulative shares of expenditure on cereals, are given in column (5) for rounds (8 and 9), and in column (6) for rounds (15 and 16). The corresponding figures for total expenditure are given in columns (7) and (8).

In line 1 of the Statement III, for the bottom 10 per cent of the population, it can be seen from columns (3) and (4), that the shares of consumption of cereals, in physical quantities, was 6.28 per cent in rounds (8 and 9) against 5.52 per cent in rounds (15 and 16), showing a difference of 12.1 points* in consumption in real terms. From columns (5) and (6), it can be seen that the share of the money value of the consumption of cereals was 4.50 per cent in rounds (8 and 9) and 5.02 per cent in rounds (15 and 16), showing a rise of 11.6 points in the share expenditure of cereals. From line 11 of the Statement III, for the top

*This is a measure of the difference of the two percentages expressed as a percentage of the estimate for the period of low prices in rounds (8 and 9).

STATEMENT III

Average Cumulative Percentage Shares of Quantity and Value of Cereals Consumed and of Total Consumer Expenditure in National Sample Survey in Rounds (15, 16) (High Prices)-All-India Rural

No.	Cumulative percentage of population]	Cereals				Total expenditure	
		Quantity		Value		rounds	rounds
		rounds 8, 9	rounds 15, 16	rounds 8, 9	rounds 15, 16	8, 9	15, 16
1.	10	6.28	5.52	4.50	5.02	3.00	3.54
2.	20	13.80	13.24	10.61	11.96	7.29	8.54
3.	30	22.44	21.64	18.18	19.88	12.67	14.50
4.	40	32.46	31.05	27.12	28.78	19.05	21.38
5.	50	42.22	40.78	36.62	38.41	26.41	29.17
6.	60	52.68	51.26	47.28	48.84	35.00	37.98
7.	70	63.70	62.22	58.44	59.70	45.16	48.04
8.	80	74.74	73.49	70.43	71.46	57.47	59.95
9.	90	86.92	85.34	84.20	84.24	72.88	74.62
10.	100	100.00	100.00	100.00	100.00	100.00	100.00
*11 top 10%		13.08	14.66	15.80	15.76	27.12	25.38

*The bottom line 11 gives the respective shares of the top 10% of the population, which are obtained by subtracting the figures for the ninth decile in line 9 from 100 in each of cols. (3) to (8).

10 per cent of the population, it can also be seen that the share of consumption of cereals in physical terms increased from 13.08 per cent in round (8 and 9) to 14.66 per cent in rounds (15 and 16), showing a rise of 12.1 points, while the share of expenditure on cereals remained practically the same, about 15.8 per cent. Changes in the shares of the total consumption expenditure can be compared from figures given in columns (7) and (8). It can be seen from line 1, for bottom 10 per cent of the population, that the share of expenditure increased from 3.00 per cent in rounds (8 and 9) to 3.54 per cent in rounds (15 and 16), or by 18.0 points, which was more than the increase of 11.6 points in the share of the expenditure on cereals. From line 11, it can be seen that the share of total consumption expenditure of the top 10 per cent of the population had decreased from 27.12 per cent to 25.38 per cent, showing a reduction of 6.4 points. To sum up, for the bottom 10 per cent of the population, the share of consumption of cereals decreased by 12.1 points in physical terms but the share of expenditure on cereals increased by 11.6 points, and the share of total expenditure increased by about 18.0 points. For the top 10 per cent of the population, the position was quite different. The share of consumption of cereals in physical quantities increased by 12.1 points, while the share expenditure remained the same, and the share of total consumption expenditure decreased by 6.4 points. It is clear that disparities in the consumption of cereals had increased with the rise in prices of cereals.

Estimates of cumulative shares, for different decile groups, given in the Statement III, are shown in the form of concentration curves in Chart 2. Two concentration curves for consumption of cereals, in physical terms, are shown in green; and two corresponding concentration curves for consumption of cereals in terms of money, that is, the two concentration curves for the expenditure on cereals, are shown in red. For purposes of comparison, two concentration curves for the total consumption expenditure are given in black.

In each case, the solid graphs represent conditions in rounds (15 and 16) when prices were high, and the broken graphs represent conditions in rounds (8 and 9), when prices were low. It can be seen that the broken green graph, for the distribution of consumption of cereals in physical terms when prices were low, is nearer to the line of equal distribution than the solid green graph representing the distribution of consumption of cereals in physical terms when prices were high. On the other hand, in the case of the two graphs in red (for distribution of expenditure on cereals) and also the two graphs in black (for distribution of total consumption expenditure), the position is reversed; broken graphs, representing conditions when prices were low, are further away from the line of equal distribution than the solid graphs, representing conditions when prices were high. In other words, when prices increase, the distribution of consumption, in terms of money, tends to become more equal, but the distribution of consumption, in physical terms, tends to become more unequal. It must be noted that it is only when the increase of prices of cereals (or of other goods and services) are relatively greater for the poorer sections of the population that one would expect the distribution of consumption in terms of money values (that is, of consumption expenditure) to become more equal, and the distribution of consumption in physical terms to become more unequal.

Test of Significance of Change in Concentration: The greater equality of the distribution of total consumption expenditure when prices are high can be examined critically with the help of the two sub-sample estimates for s.s.I and s.s.2 in the N.S.S. data for round 8 (July 1954-March 1955) and for round 16 (July 1960-June 1961) which are given in the Statement IV, and are shown graphically in Chart 3.

In the Statement IV, the cumulative percentages of the population are given in column (1); cumulative percentages of total consumption expenditure are given for sub-sample 1, sub-sample 2 and the combined sample for round 8 in column (2), column (3) and column (4) respectively; and corresponding cumulative percentages of consumption expenditure for round 16 are given in column (5), column (6) and column (7), respectively. It would be seen in the Statement IV that, for each of fractile (decile) group, all these figures for round 16 and when prices were high, are greater

STATEMENT IV

**Cumulative Percentage Shares of Total Consumer Expenditure by
Fractile Groups for Rounds 8 and 16 of the National Sample
Survey: All-India Rural**

Cumulative percentage of population	Round 8 (July 1954-March 1955)			Round 16 (July 1960-June 1961)		
	s.s. 1	s. s. 2	combined*	s.s. 1	s.s. 2	combined
(1)	(2)	(3)	(4)	(5)	(6)	(7)
10	2.90	3.11	3.00	3.47	3.36	3.41
20	7.03	7.50	7.26	8.39	8.04	8.21
30	12.09	13.01	12.54	14.29	13.76	14.01
40	18.20	19.35	18.78	21.07	20.46	20.75
50	25.34	26.61	25.98	28.79	28.04	28.40
60	33.58	35.07	34.33	37.59	36.78	37.17
70	43.25	45.20	44.23	47.65	46.71	47.16
80	54.84	57.62	56.22	59.34	58.45	58.87
90	69.56	73.53	71.55	73.90	73.48	73.65
100	100.00	100.00	100.00	100.00	100.00	100.00

*No. of sample households: Round 8, 1833; Round 16, 3,703 which roughly hold the number in each sub-sample.

than the corresponding figures for round 16 when prices were high, are greater than the corresponding figures for round 8 when prices were low. The three concentration curves, for the figures given in columns (2), (3) and (4), for round 8, when prices were low, are shown in black in Chart 3; and the three concentration curves for figures given in columns (5), (6) and (7) for round 16, when prices were high, are shown in red in Chart 3. As already pointed out, in fractile graphical analysis, the geographical area bounded by the two sub-sample graphs gives the error-area of the combined graphs. Also, the 'separation' is given by the area lying between the two graphs for the two combined samples, that is, in this case, the area lying between the graph in solid red line and the graph in solid black line. It would be seen that the three graphs in red are completely separated from the three black graphs*, and are nearer the line of equal distribution. On the basis of studies on error-areas, it may be noted that such complete separation** indicates that the difference between the two distributions of total consumption expenditure during periods of high and low prices respectively, was statistically significant. It is, therefore, reasonable to think that, with an increase in prices, the distribution of expenditure on consumption did become more equal.

*With one exception at 9th decile for round 8, namely, the cumulative per cent share 73.53 for s.s. 2 in col. (3), is slightly greater than the corresponding value 73.48 in col. (6) for round 16.

**The size of the sample, i.e., the number of households (1833 in round 8, and 3,703 in round 16) was evidently adequate for establishing the statistical significance of the separation.

Ranking of Concentration Curves by Price Levels: The concentration curves of consumption expenditure for seven N.S.S. rounds have been placed in order of increasing concentration of distribution (that is, in order of increasing distance from the diagonal line) in column (1) of the Statement V together with several series of index numbers of prices for the rural area.

STATEMENT V

Ranking of Concentration Curves for Per Capita Total Consumer Expenditure of Different N.S.S. Rounds in order of Increasing Concentration (Increasing Distance from the Diagonal or Equal Distribution Line) Against Index Numbers of Prices: All-India Rural

Sl. No.	N.S.S. round in order of increasing concentration	National income deflator	N.S.S. price index of cereals			Wholesale price index (1952-53-100)		
			bottom 10 percent	bottom 20 percent	general population	cereals	other commodities	all commodities
(0)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1.	15	105.6	138	131	116	105.6	122.4	119.1
2.	16	107.2	141	133	118	103.2	131.3	125.9
3.	12	100.4	131	126	111	103.0	110.8	109.3
4.	13	102.1	117	116	108	98.7	109.5	107.4
5.	7	98.0	100	100	100	92.8	104.1	101.9
6.	9	91.9	76	75	79	73.3	95.5	91.2
7.	8	90.4	76	79	82	77.4	100.6	96.1

Each series of price index numbers has reference to a specific field of economic activity; the different series of price index numbers are, therefore, not strictly comparable among themselves. Nevertheless, they show general agreement in the up or down movements of prices. For the rural population, it would be seen that two top curves for rounds 15 and 16 (lines 1, 2) are associated with the highest levels of all the series of price index numbers; the intermediate curves for rounds 12 and 13 (lines 3, 4) are associated with intermediate levels of prices; and finally, curves for 7, 8 and 9 rounds, at the bottom (line 5, 6, 7) are associated with the lowest levels of prices.

Effect of Rise in Prices on Disparities: On the whole, the higher the price level in any round of the survey, the nearer is the position of the corresponding concentration curve of total consumption expenditure to the diagonal line, that is, the greater is the equality of distribution, by size, of total consumption expenditure. Conversely, the lower the level of prices during a round of survey, the greater is the inequality of distribution, by size, of total consumption expenditure. An increase in prices is thus associated with greater equality, and a decrease in prices, with greater inequality, of distribution by size of expenditure.

Association Between Higher Prices and Greater Equality of Distribution of Expenditure: This observed association between higher price levels and greater equality of distribution of consumption expenditure deserves further consideration. From the Statement V, columns (6) and (7), it is seen that the increase in the wholesale prices of commodities, other than cereals, was much greater than the rise in the wholesale price of cereals, and, almost certainly, was also greater than the rise in the retail price of cereals. Secondly, the rise in the price of cereals was relatively much greater for the poorer sections of the population; and it is very likely that the rise in the price of commodities, other than cereals, was also relatively greater for the poorer people. The poorer sections of the population would have to pay relatively higher prices to maintain the same level of real consumption, and their share of total consumption expenditure would increase without, however, an increase in their share of real consumption, in comparison with sections which were better off. That is to say an appreciable increase in prices would affect poorer sections more adversely, and would generally lead to an increase of disparities in consumption in real terms. It may be noted, however, that disparities may increase, or may remain the same, or may decrease, while the absolute level of consumption changes in one direction or in another. For social justice, it is necessary that the absolute level of real consumption should increase and inequalities should also decrease. Unfortunately, a rise of prices in India was found, very often, not only to have increased disparities but also to have lowered the absolute level of consumption in real terms of the poorest sections of the population*.

General Conclusion: From the information and analysis given in a separate paper**, it seems likely that there was some improvement in the level of living and an increase of opportunities in many directions for most of the people of India during the first decade of planning (1951-1961). The rate of growth of consumption was still low. Benefits arising from growth also seemed to have accrued, in a larger proportion,

*International comparison could not be made because it was not possible, upto 1966 or 1967, to secure, or to trace, published data, (or unpublished information to which access could be obtained) on changes in prices of cereals over time, separately, for different fractile groups or for different income brackets or different expenditure brackets, that is, separately, for households of different levels of living for any other country (not excepting, the (U.K., U.S.A., U.S.S.R., Japan, etc.).

**The present note is a slightly revised version of a note which was placed before the Seventh Conference of Commonwealth Statisticians in New Delhi in November 1970. The opposite effects of rise in prices on concentration of consumption in money values and in real terms were placed by the author as Chairman with other materials before the Income Distribution Committee of India in February 1964, as a draft of part II of its report. Because of differences of opinion, further studies were undertaken during the next four years. As no unanimous decision could be reached, part II of the report was published in July 1969 excluding the detailed studies which the Committee decided would be published as a scientific paper by the author in his individual capacity.

to the richer sections of the people. In consequence, disparities between the rich and the poor did not generally decrease, but increased in many respects. The level of living is so low for a very large part of the population that it would be difficult to bring about an appreciable improvement in the absolute level of real consumption or a reduction of disparities without a large and rapid increase of income and availability of goods and services in the near future.

CHART 1 NATIONAL SAMPLE SURVEY: ALL INDIA RURAL: INDEX NUMBERS, BY FRACTILE GROUPS, OF AVERAGE PRICE OF CEREALS IN ROUNDS (15, 16) WITH PRICE IN ROUNDS (8, 9) AS BASE = 100.

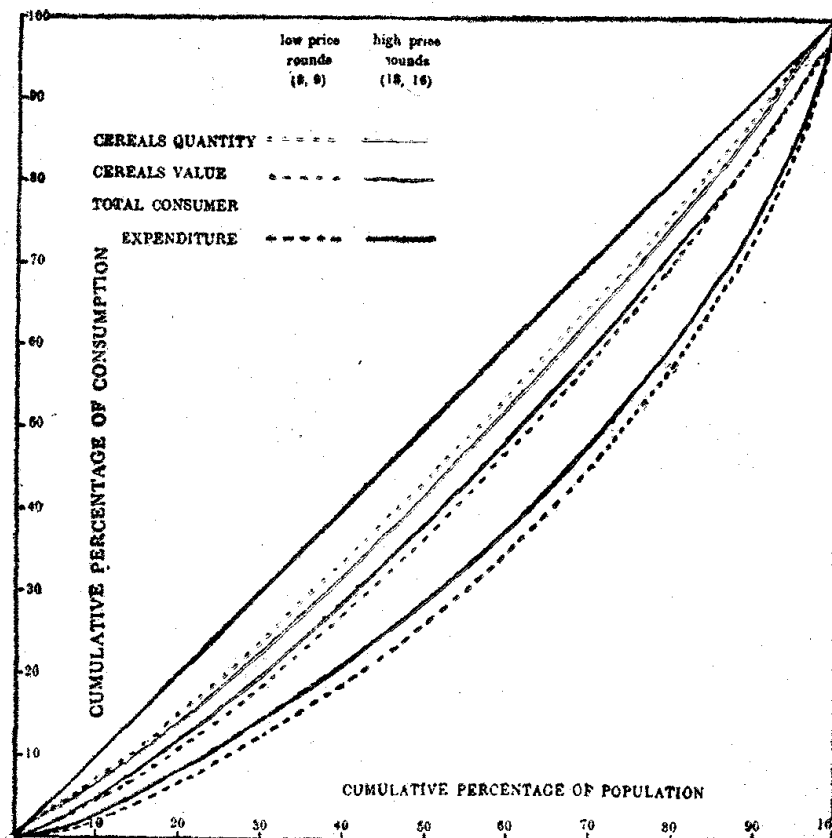
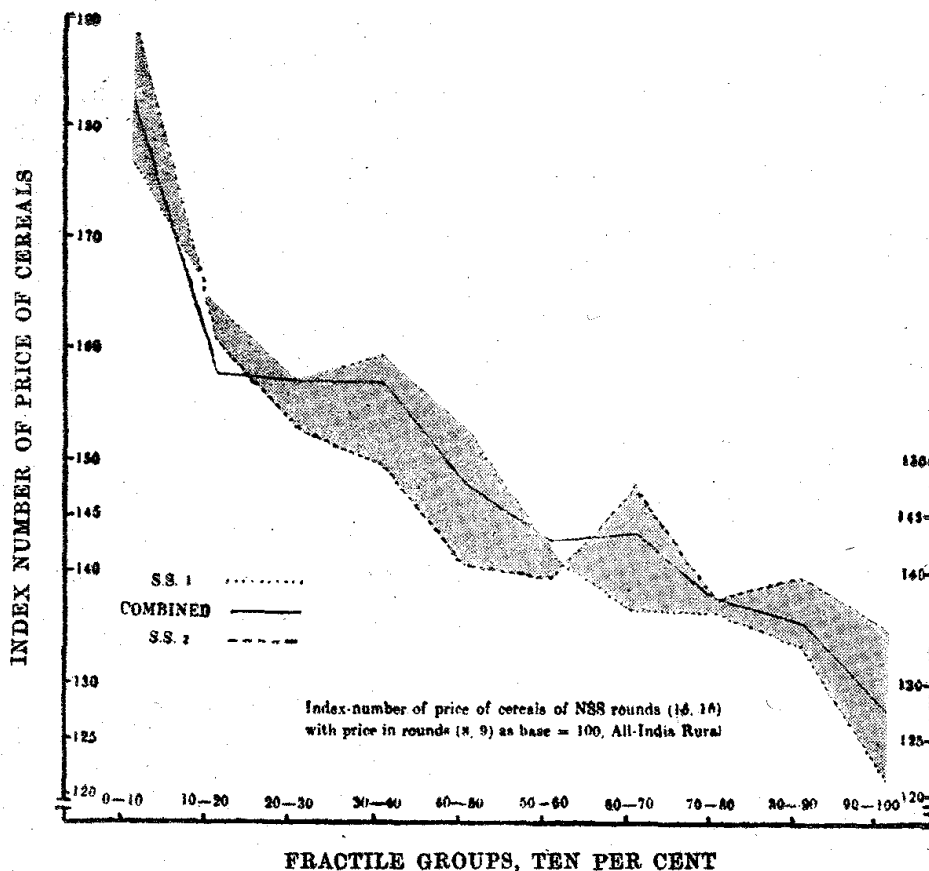
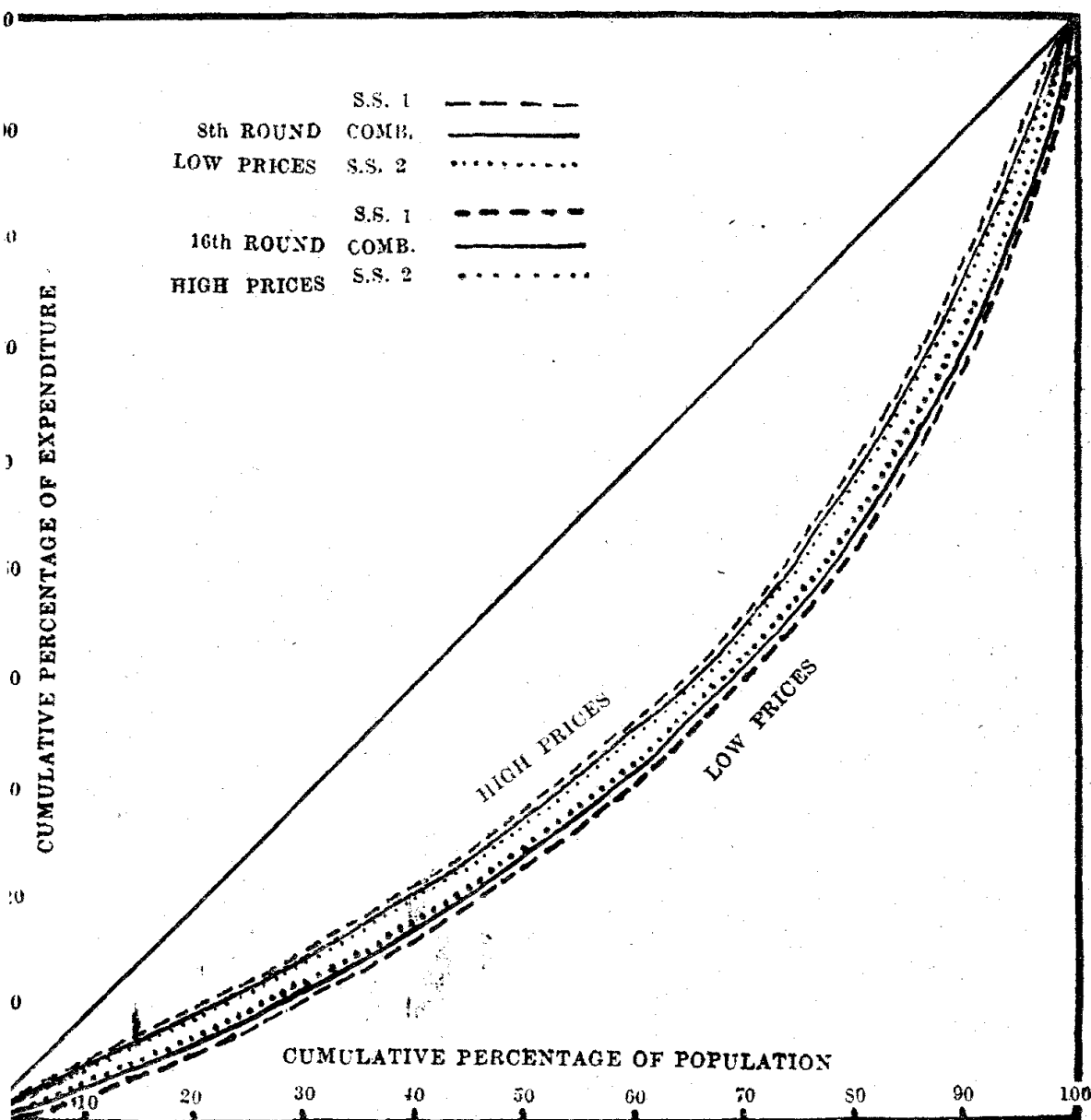


CHART 2 : NATIONAL SAMPLE SURVEY : ALL INDIA RURAL: CONCENTRATION CURVES FOR PER CAPITA CONSUMPTION OF CEREALS PER 30 DAYS, IN PHYSICAL TERMS (QUANTITY) AND IN VALUE TERMS AND ALSO FOR TOTAL CONSUMPTION EXPENDITURE IN ROUNDS (8, 9) AND (15, 16).



PART 3 : NATIONAL SAMPLE SURVEY : ALL INDIA RURAL : ROUNDS 8 AND 16 :
 CONCENTRATION CURVES FOR THE DISTRIBUTION OF TOTAL
 PER CAPITA CONSUMER EXPENDITURE PER 30 DAYS.