

**A Review of Research on Poverty (1980-1984)**  
**and**  
**An Empirical Verification of some**  
**Approaches to the Measurement**  
**of Poverty**

BY

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**A Dissertation submitted to the Bharathiar University, Coimbatore,  
in Partial Fulfilment of the Requirements for  
the Degree of Master of Arts**

**MAY 1985**

ACKNOWLEDGEMENT



## ACKNOWLEDGEMENT

The investigator expresses her deep sense of gratitude to Tmt. G. Ramathilagam, M.A., M.Phil., Dip.Ed. (Madras), Professor of Economics, Sri Avinashilingam Home Science Autonomous College for Women, Coimbatore, for her continuous guidance and suggestions given throughout the study and for its design.

She expresses her heartfelt thanks to Tmt. R. Annapoorani, M.A., Assistant Professor of Economics, Sri Avinashilingam Home Science Autonomous College for Women, for her constant guidance and help during the period of study.

The investigator thanks Dr. (Selvi) B. Saraswathi Bhatji, Professor and Head of the Department of Economics, Sri Avinashilingam Home Science Autonomous College for Women for all her help.

The investigator thanks Dr. (Tmt.) Lakshmi Santa Rajagopal, M.S. (Tennessee), Ph.D. (Madras), Principal, Sri Avinashilingam Home Science College for Women, for the facilities provided.

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## INTRODUCTION

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## INTRODUCTION

Poverty is an economic phenomenon which is complex in its origin as well as in its manifestations. Poverty is said to exist when people lack the means to satisfy their basic needs. In this context then identification of poor people first requires a determination of what constitutes the basic needs. They may cover those necessary for survival or broadly those reflecting the prevailing standard of living in a community. Thus the issue of identification of the poor is a tricky one.

Since poverty is a product of a number of interrelated and independent socio-economic and demographic elements such as undernourishment, vulnerability to disease, difficulty of access to safe drinking water, etc., it becomes difficult to arrive at a workable definition of poverty. McNamara (1980) defined poverty as a condition of life so characterised by malnutrition, illiteracy, disease, high infant mortality and low-life expectancy as to be beneath any reasonable definition of human decency. Rao (1981) proposes that poverty has to be identified with deficiency in total level of living. It includes not only energy requirements but also balanced diet needed for health and other components of basic needs essential for human existence at a tolerable level.

The Food and Agricultural Organisation of the United Nations and other national level research institutes like the Indian Council of Medical Research have developed standards for minimum intake of calories and proteins necessary for normally active adults. This makes it easy to compare the calculated per capita consumption of calories with minimum consumption value from nutritional standpoint and to conclude on this basis.

The two distinct approaches used to identify poverty are: absolute and relative. The absolute poverty reflects mainly in the inadequate food intake; malnourishment and undernourishment on a mass scale. The relative poverty is measured in terms of inequality of income distribution.

A constellation of forces tend to act and react upon one another in such a way as to keep a poor country in a state of poverty. This is reflected in the low productivity of the nation. Low capital formation and economic backwardness clubbed with market imperfections keep the circle repeating. The poor development of natural and human resources aggravates the poverty condition.

On the supply side, the basic vicious circle stems from the fact that in underdeveloped countries the productivity is low due to deficiency of capital, market

imperfection, economic backwardness and underdevelopment. On the demand side, the low level of real income leads to low level of demand which in turn leads to low rate of investment and hence back to deficiency of capital and low productivity; hence low savings. Thus the vicious circle operates both on the demand and supply side.

The persistence of poverty in India makes it obvious that even refinements of the concept will not alter the picture. Despite the progress of the nation, the fact continues to remain, that poverty elimination measures have not been able to reduce the absolute numbers of poor or destitutes. No wonder, the issue of poverty is at the centre of politics.

Poverty in the Indian context has generally been viewed in terms of the minimum level of survival which again has been formulated in terms of minimum requirement of calorie intake (Dasgupta, 1982). The Planning Commission has adopted the criteria of per capita consumption expenditure for determining the poverty line. In the Sixth Plan document, poverty norm has been defined as mid-point of monthly per capita expenditure class having a daily calorie intake of 2400 per person in rural areas and 2100 in urban areas. At 1979-80 prices, the mid-points, are Rs.76 in rural areas and Rs.88 in urban areas. In 1982-83, forty

per cent of the population was below the poverty line in India.

Regarding the causes of poverty, Dandekar and Rath (1971) attributed poverty to unduly large number of dependents to be supported per earner in household, lack of resources in rural area and the dominance of agricultural labour households in rural areas.

The Planning Commission (1974) pointed out that under-development and inequality were the twin causes of poverty. Poverty is associated with low productivity and non-availability of productive work, as also with gross inequalities of assets, mainly land. Dasgupta (1982) regards land inequality in rural areas as the most important reason for poverty. Subramanyam (1982) opined that poverty and unemployment are positively associated in the sense that the occupational group which are subjected to higher incidence of poverty are also subject to higher incidence of unemployment. Nearly 17 million remained unemployed at the end of Fifty<sup>h</sup> Five Year Plan. According to the Sixth Plan document, the rural unemployment was 14.92 million, urban unemployment was 5.44 million and for All India it was 20.36 million.

The NSS data give the information on the quantity consumed as well the consumer expenditure, based on the details of thirty days of consumption preceding the data of the survey. The researchers on the problem of poverty have used the National Sample Survey (NSS) data on consumer expenditure. Their studies relate not only to particular regions, they also attempt a comparison between the states.

Research interest on the problem of poverty became intense with publication of <sup>a</sup> <sup>e</sup> Dandekar and Rath's "Poverty in India (1971)". Since then a large body of research, official as well as academic, has concentrated on the theme of poverty. Each one of them have used different definitions and norms and followed different methodologies to estimate the population below poverty line. Some of them have assessed the impact of special programmes designed to eradicate poverty.

In the context of such studies, the investigator thought that there was a need for compiling them and comparing them at one stroke, so as to design a fundamental definition that could be unambiguously used in future research and that would suggest methodology that could be followed by data generating agencies like the NSS and eventually help in inter-temporal studies overtime.

The current study is an effort to evaluate the research done on the area during the period 1980-84. The specific purpose of this investigation is to examine these studies for:

1. the definition and norms used by various researchers to identify poverty;
2. methodologies adopted by them towards that end;
3. the quantitative estimates derived by them;
4. any improvements/suggestions contained in the studies for improving the data generating system;
5. assessment of impact of specific programme on eradication of poverty; and
6. an empirical verification of the different approaches to the measurement of poverty using the Tamil Nadu data for 1977-78.

The study is organised and presented under the following chapters:

- I. Concept of poverty;
- II. Norms and Extent of poverty;
- III. Approaches to the measurement of poverty
- IV. An Empirical verification of the approaches to the measurement of poverty;
- V. Measures for the eradication of poverty;
- VI. Conclusions and suggestions.

CONCEPT OF POVERTY

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## II. CONCEPT OF POVERTY

Since poverty is a product of a number of interrelated and independent social, economic, and demographic elements such as under nourishment, vulnerability to disease, difficulty of access to safe drinking water, etc., it becomes difficult to arrive at a workable definition of poverty.

The two distinct approaches concerning the definitions of poverty that are discernible in the studies are: the absolute poverty-measured in terms of some kind of notion of subsistence and relative poverty - measured in terms of inequality in income distribution. These two approaches towards definitions of poverty are summarised as under:

- A. Absolute poverty and
- B. Relative poverty

(A) Absolute poverty:

Johnson (1966) opined poverty in the usual sense as existing when the resources of families of individuals are inadequate to provide a socially acceptable standard of living.

Run (1970) defined poverty as subsistence, inequality and externality; subsistence concerned with the minimum provision needed to maintain health and working capacity;

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inequality concerned with the relative position of income groups to each other; and externality concerned with social consequence of poverty for the rest of society rather than in terms of poor.

Ramamurthy (1974) defined poverty as the gap between income on one hand and certain minimal standards of life on the other. According to Draft Fifth Year Plan (1974) poverty level has to be defined in terms of a minimum level of consumption. To the State Planning Commission (1974), poverty can be looked upon from nutritional angle and minimum needs angle. Sen (1974) had defined poverty in the light of socially accepted "minimal" standard of living which is influenced by the average income level.

Beckerman (1979) had shown that information on income shortfalls - the extent to which income falls below the poverty line - very usefully supplements that contained in estimates of poverty incidence. These income shortfalls are often known as poverty gaps.

McNamara (1980) defined it as a condition of life so characterised by mal-nutrition, illiteracy, disease, high infant mortality and low life expectancy as to be <sup>u</sup>beneth <sup>^</sup>any ~~infant~~ reasonable definition of human decency. George (1980) defined poverty as a concept related to minimum

subsistence level expressed in terms of money that is necessary to maintain health and working efficiency.

Agarwal (1981) opined that absolute poverty prevails when income/consumption is lower than the minimum requirements of physical subsistence for healthy living. Dandekar (1981) opined that to determine the poverty line is to agree upon a certain level of income or consumer expenditure as necessary to meet minimum needs of life. Nair (1981) said that poverty is largely a cultural problem and it involves a lot of value judgements, since, life styles, standards and norms vary from society to society. Rao (1981) proposed that poverty has to be identified with deficiency in total level of living. It includes not only energy requirements but also balanced diet needed for health and other components of basic needs essential for human culture at a tolerable level. Rudra (1981) said, for India, however the minimum would have to mean an absolute minimum - a standard of living such that anything less is incompatible with the maintenance of physical well-being. Sukhatme (1981), defines poor as a person who cannot afford a diet which meets his minimum energy needs for a healthy active life.

Dasgupta (1982) defined poverty in terms of the minimum level of survival which again has been formulated in terms of minimum requirements of calorie intake. To

Mehta (1982), the poverty studies identified the nutritionally vulnerable groups in population in terms of income levels. Thimmaiah (1982) referred to poverty as inadequacy of income to meet the basic necessities of life. Vivekananda (1982) defined poverty in terms relating to nutrition of minimum expenditure.

Brema (1983) observed that poor are simply those members of society whose income fall below the standard minimum. Ojha (1983) defined absolute poverty as nothing more than a basic nutritional minimum of 518 grams of food grains yielding 2250 calories per day per person. Ratnam (1983) defined poverty in terms of consumerism. Singh et al. (1983) defined poverty in terms of consumption expenditure.

Chandrashekar et al., (1984) defined absolute poverty as related to minimum <sup>income</sup> or consumption level laid down by some norm of living. Joshi (1984) opined that poverty is associated with per capita calorie intake, income level or consumption level.

Thus a person is said to be in absolute poverty when he has inadequate income to cover his basic needs and also enable him a minimum standard of living and physical well being. A person in absolute poverty may not have the required calorie intake to meet his physical sustenance.<sup>an</sup>

The norms given to classify a person as poor differ from place to place. It cannot be judged on the basis of single criteria, since it involves a lot of cultural problems and value judgements.

(B) Relative poverty:

Townsend (1970) opined that poverty must be regarded as a general form of relative deprivation which is the effect of mal-distribution of resources.

Fuchs (1977) defined relative poverty as a fraction of the total population that has income which is less than half of the median income.

George (1980) defined poverty as a general form of relative deprivation arising out of maldistribution of resources.

Agarwal (1981) opined that relative poverty is associated with low productivity and non-availability of productive work, as also with gross inequalities of assets mainly land.

Dasgupta (1982) identified asset distribution or land inequality in rural area as the most important reason for poverty.

Jain (1983) stated that in the relative sense, poverty is related to the income or consumption expenditure distribution and that section of population, whose resources are so depressed as to be deprived of enjoying benefits and participating in the activities which are customary in that society can be said to be in poverty.

Chelliah (1983) viewed that poverty can also be due to lack of employment or lack of wealth. Rao (1983) stated that poverty is a result of lack of assets and employment on wage basis.

Rao and Chandrasekar (1984) defined relative poverty as related to income or consumption expenditure distribution. Tripathy (1984) said that the problem of poverty had its origin in low asset base and unemployment. Krishnan (1984) opined that the cause of rural poverty is low income which may primarily be due to inadequate access to land.

Summing up, there has been a debate regarding the ideology and poverty line. It refers to the subsistence levels of poverty and to what degree those in power choose to acknowledge that subsistence. Hence, in the relative sense, a person is said to be poor when he does not have the income due to unemployment or lack of proper distribution of assets and land holding. This invariably affects

his level of living and participation in the activities of society. Some authors have related it to the income or consumption expenditure, but it is lack of production<sup>ve</sup> work that keeps a person at a low level of living. Relative poverty arises because the gains accrue more to the rich rather than the poor, widening the gap in the process.

NORMS AND EXTENT OF POVERTY



### III. NORMS AND EXTENT OF POVERTY

Dandekar (1981) maintained that the poverty limits and classification of individuals as poor must be determined by objective standards by society as a whole and not by poor themselves. The four criteria that have been by and large used in the studies for defining the poverty line comprise of the proportion of expenditure taken up by specified essential items such as food; calorie value of food; cost of balanced diet and cost of essentials of tolerable human existence.

The set of norms underlying these criteria are:

- A. Calorie intake and
- B. Consumer expenditure

#### A. Calorie intake:

Various estimates of minimum calorie requirements for the representative "man and woman" have been made by different authorities.

The Nutrition Advisory Committee of India (1960) had worked out the calorie requirement for India at 2780 and 2080 calories for reference man and woman respectively.

The Indian Council of Medical Research (1970) prescribed a nutrition diet as one that provided roughly 2400 calories which is thought just sufficient to satisfy the biological needs of human system.

According to the State Planning Commission (1972) 60 per cent of the people in Tamil Nadu were below the poverty line. Their daily consumption ranged from 1000 to 1800 kilo calories.

Ramamurthy (1974) had estimated the population below poverty line in Tamil Nadu using the calorie norm. Table I gives his estimates for Tamil Nadu.

TABLE I  
PERCENT OF POOR POPULATION IN TAMIL NADU (1960-70)

Year	Poor population	
	In percentage	In absolute numbers (millions)
1960-61	42.90	14.44
1961-62	31.10	10.68
1963-64	35.10	12.46
1964-65	41.90	15.35
1969-70	43.09	16.95

Though the percentage of poor population was subject to variation, there was an absolute increase in the number of people below poverty line in Tamil Nadu over 1960-61 to 1969-70, from 14.44 million in 1960-61 to 16.95<sup>million</sup> in 1969-70.

Alhuwalia (1979) had suggested the limit to be 2250 calories per day per person.

The Sixty<sup>h</sup> Plan Task Force on Projection of Minimum Needs and Effective Consumption Demand (1979) had defined poverty line as the mid-point of monthly per capita expenditure class having calorie intake of 2400 kilograms per person in rural areas and 2100 kilograms in urban areas. The poverty line has been fixed at an income of Rs.3500/- per annum for an average family of five people and at 1970-71 and 1979-80 prices, the mid-points are Rs.76/- in rural and Rs.88/- in urban areas.

To Alamgir (1980) an energy intake of 1500 kilo-calories per person per day is minimum required<sup>without</sup> which the individual's ability to carry out minimum necessary activity would be impaired.

Acharya (1981) placed 2124 kilo calories per day as the calorie requirement using the age-wise distribution of population of 1961 census and later 1971 census.

Berg (1981) had used the extent of undernutrition as the single indicator of poverty.

On the basis of 26th Round of National Sample Survey data on consumer expenditure and calorie intake of 2300 kilograms, Rao (1981) estimated that 17.9 per cent of households were below the cut-off point of expenditure.

Table II gives his estimates of the number of households that were found to be calorie deficient in 1971-72.

TABLE II  
ESTIMATES OF THE CALORIE DEFICIENT HOUSEHOLDS  
IN INDIA (1971-72)

Monthly expenditure per consumer Unit (in rupees)	Number of households	Number of households with calorie intake per day per consumer unit		Average calorie intake per day per consumer unit
		Below 2300	Above 2300	
0-15	444	404	40	1493
15-21	1207	921	286	1957
21-24	813	466	347	2287
24-28	1174	518	656	2431
28-34	1748	492	1256	2734
34-43	2028	300	1728	3127
43-55	1655	123	1532	3513
55-75	1319	53	1266	4016
75-100	598	10	588	4574
Above 100	482	11	477	6181
<b>All classes</b>	<b>11468</b>	<b>3298</b>	<b>8170</b>	<b>2724</b>

Taking 2300 calories as the average requirements, 921 number of households were said to be below the average calorie intake. Their monthly per capita expenditure was in the range of Rs.15-21.

The Nutritional Norm Measurement Board (1982), on the basis of its survey done by weightment method found that 46.5 per cent of population were undernourished.

The minimum consumer expenditure necessary to ensure the 2250 calories intake was estimated as Rs.58.35 by Reddy and Mitra (1982). Using this criterion, they found that 83 per cent of the people in rural Medak were below the poverty line.

Taking the minimum calorie intake as 2400 in urban areas and 2100 in rural areas as given by the Task Force of the Sixth Five Year Plan, the estimates of poor population obtained by Sixth Five Year Plan with this norm was in agreement with those derived by Nutritional Norm Measurement Board (48 per cent) and Reddy and Mitra (41 per cent). As against this minimum, the calorie norm given by the State Planning Commission of Tamil Nadu was 1000-1800 kilo calories.

## B. Consumer Expenditure:

The cost of minimum living varies between rural and urban areas of different States. The level of per capita consumer expenditure at which a diet with 2250 calories is attained differs widely from State to State. This is partly due to the variation in consumer preferences across the States (Prasad, 1983).

Minhas (1962) assessed the <sup>o</sup>proportion of people below the poverty line by using two alternate figures for minimum consumer expenditure. The first figure was the official estimate of Rs.240/- and the other was Rs.200/- per capita consumer expenditure. The results of his study are given in Table III.

TABLE III  
 THE ESTIMATED NUMBER OF POOR ON THE BASIS OF  
 MINIMUM CONSUMER EXPENDITURE IN INDIA  
 (1956-68)

Year	Below Rs.240 per annum		Below Rs.200 per annum	
	Percentage	Number (in millions)	Percentage	Number (in millions)
1956-57	65.60	215	52.40	173
1957-58	63.20	212	50.20	169
1960-61	59.40	211	46.60	164
1961-62	56.40	206	43.60	159
1963-64	57.80	221	44.20	169
1964-65	51.60	202	39.30	154
1967-68	50.60	210	37.10	154

The proportion of population below the poverty line appeared to have steadily fallen from 1956-57 to 1967-68 from 65.60 per cent to 50.60 per cent using the criterion of Rs.240/- as per capita consumer expenditure per annum. In absolute numbers, the population below the poverty line had decreased by 5 million over the same period. Using Rs.240/- as per capita consumer expenditure per annum, the absolute number below the poverty line appeared to have declined by 19 million.

Minhas also studied the distribution of poor population across the various fractile groups. Table IV reveals the extent of poverty based on National Sample Survey data in terms of percentage.

TABLE IV

EXTENT OF POVERTY ACROSS THE DIFFERENT FRACTILE GROUPS  
IN INDIA OVER THE PERIOD 1956-57 to 1967-68

Fractile group	Percentage of total consumption expenditure by fractile group						
	1956-57	1957-58	1960-61	1961-62	1963-64	1964-65	1967-68
Poorest 5%	1.35	1.37	1.46	1.35	1.51	1.47	1.48
5 to 10	1.89	1.88	1.94	1.87	2.07	2.01	2.02
10 to 20	4.67	4.67	4.80	4.84	5.07	4.99	5.01
20 to 30	5.75	5.62	5.80	5.71	6.14	6.07	6.08
30 to 40	6.70	6.61	6.74	6.81	7.15	7.05	7.09
40 to 50	7.74	7.66	7.65	7.94	8.17	8.11	8.13
50 to 60	8.91	8.75	8.77	9.16	9.33	9.51	9.29
60 to 70	10.35	10.11	9.99	10.59	10.72	10.67	10.68
70 to 80	12.21	11.98	11.71	12.53	12.43	12.45	12.40
80 to 90	15.11	14.84	14.78	15.43	15.08	15.18	15.15
90 to 95	9.55	9.48	9.53	9.69	9.27	9.36	9.36
Richest 5%	15.76	17.04	16.82	14.08	13.06	13.33	13.24

A comparison of the percentage of total consumption expenditure of the poorest 5 per cent and the richest 5 per cent showed that there was an increase in the expenditure by the poorest 5 per cent and decline in the expenditure of the richest 5 per cent of the population.

Rural prices are generally lower than urban prices. Hence Bardhan (1971) adopted a per capita monthly consumption expenditure of Rs.15/- as the norm of the minimum for rural areas as against Rs.21/- as the norm of minimum expenditure in urban areas. Using National Sample survey consumer expenditure data, he estimated that 38 per cent constituting about 135 million population were below the poverty line in 1961-62 and the proportion increased to 54 per cent (246 million) in 1968-69.

According to Dandekar and Rath's estimation (1971) an annual per capita consumer expenditure of at least Rs.170/- was necessary to provide a minimal diet of just 2250 calories in 1960-61. About 33 per cent of rural population could not obtain this minimum. The urban households would have required Rs.271/- per capita per annum (in 1960-61) for a barely adequate diet. About 49 per cent of urban population did not obtain it.

The distribution of poor population among the per capita monthly expenditure classes is shown in Table V.

TABLE V

DISTRIBUTION OF POOR POPULATION BY PER CAPITA  
CONSUMER EXPENDITURE IN RURAL AND URBAN INDIA (1960-61)

Monthly per capita expenditure class (in rupees)	Percentage of rural population	Percentage of urban population
0 to 8	6.38	2.15
8 to 10	11.95	5.49
10 to 13	9.28	7.19
13 to 15	9.82	6.86
15 to 18	13.79	10.71
18 to 21	11.44	11.40

Table V reveals that the percentage of poor people in rural area lies in the range Rs.15 to 18 while for the urban area, the percentage lies in the range Rs.18 to 21.

Dandekar and Rath revised upwards the per capita annual expenditure as Rs.324 in rural areas and Rs.486 in urban areas at 1968-69 prices. On this basis, 40 per cent in rural area and 50 per cent in urban areas were below the poverty line.

Ahluwalia (1973-74) adjusted All India figure of Rs.15 per capita per month for inter-state price variations to estimate the extent of poverty. Kurien (1973-74), took Rs.15 at 1960-61 prices in Tamil Nadu in rural areas as the norm. The estimates of these two researchers on the extent of poverty in Tamil Nadu are given in Table VI.

TABLE VI

ALTERNATIVE ESTIMATES OF POOR POPULATION IN TAMIL NADU  
(1957-58 to 1972-73)

Year	Estimates in per cent	
	Ahluwalia	Kurien
1957-58	67.80	53.10
1959-60	64.40	53.80
1960-61	53.90	47.90
1961-62	51.00	36.00
1963-64	52.00	39.00
1970-71	57.30	60.70
1972-73	48.30	41.60

By and large, Ahluwalia's estimates were higher than those of Kurien. The ratio of decline in poverty over the period however, differs only marginally in both their estimates. Ahluwalia's estimates showed a decline of 19.50 per cent while Kurien's showed a decline of 11.50 per cent for the period from 1957-58 to 1972-73.

Srinivasan and Bardhan had edited a number of articles and studies on Poverty and Income Distribution in India in 1976. They had compiled the figure of percentage distribution of disposable personal income by decile group of population as given in the studies of National Council of Applied Economic Research (NCAER) and others. These details are given in Table VII.

TABLE VII  
 PERCENTAGE DISTRIBUTION OF DISPOSABLE PERSONAL INCOME  
 BY DECILE GROUPS OF POPULATION IN INDIA (1961-65)

Decile groups	Percentage distribution of population			
	Ranadive 1961-62	Ojha and Bhatt 1962-63	1964-65	NCAER 1964-65
0 to 10	3.40	3.09	3.00	3.14
10-20	4.40	4.31	4.00	4.36
20-30	5.39	5.21	5.00	5.10
30-40	6.25	5.97	6.00	5.99
40-50	7.06	6.70	7.00	6.85
50-60	8.16	8.06	7.00	7.72
60-70	9.18	8.88	9.00	8.81
70-80	10.69	10.90	12.00	10.51
80-90	16.87	15.81	13.00	14.14
90-100	29.10	30.89	35.00	33.35
Bottom 20%	7.80	7.60	7.00	7.50
Top 20%	45.47	46.70	48.00	47.41

These studies showed that the marked extent of inequality obtaining in the distribution of disposable personal income. The share of the bottom 20 per cent of the population in the disposable income had remained around 7 per cent throughout the period, while the share of the top 20 per cent of the population had varied between 45 and 48 per cent.

Dantwala (1980) took the national average of per capita consumption as aspiration norm and argued that in 1961-62, 69.25 per cent of the people in rural areas had less than Rs.21.47 per month. In urban areas 71.53 per cent of people lived below the average urban consumer expenditure of Rs.40/- per month and corresponding figures for 1968-69 were 68 per cent and 72 per cent respectively.

Table VIII gives the details of the Official Estimates of people living below the poverty line in the country in 1980.

TABLE VIII  
OFFICIAL ESTIMATES OF PEOPLE LIVING BELOW THE  
POVERTY LINE (1980)

Source	Reference year	Poverty line (in rupees)	Total Population below the poverty line (in percent)
Fifth Plan	1973-74 (at 1960-61 prices)	40.69	40.00
Expert Committee of Planning Commission	1973-74 (at 1970-71 prices)	62.00 X Urban X 53.00 X Rural X	62.73
NSS 28th Round	1973-74	Very destitutes 12.56 Destitute 15.76  Poor 19.42	13.24  25.50  19.59
VI Plan Draft	1976-77*	Urban X 61.3 X Rural X 71.3 X	47.85

\*On basis of calories 2400 kilograms per day for rural  
and 2100 kilograms per day for urban areas.

Table VIII reveals that the poverty line is rising continuously due to rise in prices. In 1960-61, Rs.20/- was determined as poverty line. In Fifth Plan, it was estimated that Rs.40.60 was poverty line in 1973-74. But in the Sixty<sup>h</sup> Plan Draft (1979-83), the poverty line has been further raised to Rs.61.3 for rural population and Rs.71.3 for urban population. Consequently, percentage of the population below the poverty line had increased from 40 per<sup>h</sup>cent in 1973-74 to 46.33 per<sup>h</sup>cent in 1982-83.

Srinivasan and Kumaraswamy (1961) had studied the issue of poverty using the 32nd Round Survey on consumer expenditure relating to the year 1977-78. They had estimated the cut-off<sup>d</sup> point of average monthly per capita consumption expenditure for urban and rural areas as Rs.44.96 and Rs.53.51 in rural areas. They had also studied the extent of inequality in the distribution of expenditure in the rural and urban areas. The distribution of consumer expenditure across the decile group is given in Table IX.

TABLE IX  
 SHARE OF TOTAL PRIVATE CONSUMPTION EXPENDITURE  
 IN RURAL AND URBAN INDIA (1977-78)

Decile group	Percentage of population	
	Rural	Urban
0-10	3.65	3.36
10-20	5.12	4.67
20-30	6.24	5.59
30-40	6.56	6.60
40-50	8.03	7.39
50-60	8.66	8.64
60-70	8.84	9.77
70-80	11.77	12.37
80-90	14.55	14.24
90-100	25.58	27.46

The share of the lowest 20 per cent of the population and the top 20 per cent of the population showed that there was no difference in the degree of inequality in consumer expenditure distribution between the rural and urban areas.

Thimmaiah (1982) states that poverty is a relative concept. It refers to inadequacy of income to meet the basic necessities of life. He has reckoned the year wise minimum amount of consumer expenditure for the urban and rural areas of Karnataka for the period 1960-61 to 1974-75 and also estimated the population below the poverty line in each of these years. The details are given in Table X.

TABLE X  
 NORMS AND EXTENT OF POVERTY IN KARNATAKA  
 (1960-61 to 1974-75)

Year	Urban area		Rural area	
	Minimum consumer expenditure (in rupees)	Poor population (in percent)	Minimum consumer expenditure (in rupees)	Poor Population (in percent)
1960-61	258	45.14	172	37.49
1961-62	275	55.67	172	33.10
1963-64	316	59.45	188	54.14
1964-65	322	50.75	251	59.07
1965-66	377	65.89	294	66.41
1966-67	385	64.97	300	58.28
1967-68	413	59.26	322	53.27
1968-69	426	52.70	313	52.32
1969-70	435	50.39	303	51.37
1970-71	454	51.63	323	51.51
1971-72	512	48.51	375	43.90
1972-73	611	48.72	473	48.87
1974-75	729	39.05	592	30.68

The minimum per capita consumer expenditure per annum had gone up from Rs.258 in 1960-61 to Rs.729 in 1974-75 in the urban Karnataka, whereas the same had gone up from Rs.172 to Rs.592 in rural Karnataka. In rural areas, the consumer expenditure norms had increased by 3.3 times as against 2.8 times in the urban areas, showing that the rural areas had been hit the most by the increase in prices. The highest incidence of poverty was obtained in this State in 1965-66, when two-thirds of population was living below the poverty line. This ratio had declined to 39 per cent in 1974-75, when again the lowest incidence of poverty was observed in this State. While both the urban and rural areas were equally poor in 1965-66, the urban areas were poorer than the rural areas in 1974-75.

Summing up, based on the estimates given by the Planning Commission for the year 1960-61 as Rs.18.90 (rural) and Rs.20.00 (urban), Minhas gave the percentage below the poverty line as 50.6 per cent.

For 1973-74, Bardhan, Ahluwalia and Kurien, accepted Rs.15/- as the per capita consumer expenditure. Bardhan estimated 54 per cent as below the poverty line as against 40 per cent given by Official estimates. The estimates given by Kurien and Ahluwalia were 41.6 per cent and 48.3 per cent. Dandekar (1971) gave Rs.170 as the necessary

per capita consumer expenditure to provide a minimal diet of 2250 kilo calories at 1960-61 prices.

Dantwala in his study (1980) identified the per capita consumption norm as Rs.21 in the rural and Rs.40 in urban areas at 1960-61 prices and estimated 69.25 per cent in rural areas and 71.53 per cent in urban areas were below the poverty line.

The estimates given by Thimmaiah (1982) for rural and urban areas in Karnataka were 30.65 per cent and 39.05 per cent, taking the consumer expenditure as Rs.592 and Rs.729 respectively. The extent of poverty in Karnataka was high as against the Official estimate of 40 per cent. These estimates reveal the rising proportion of people below the poverty line.

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APPROACHES TO THE MEASUREMENT OF POVERTY

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IV. APPROACHES TO MEASUREMENT OF POVERTY  
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The Researchers on the study of poverty have used varying methodologies to estimate poverty and to arrive at policy prescriptions. In this chapter, the investigator has summarised the methodologies followed by different authors and given them under the following headings:

- a) Watt's Welfare Ratio;
- b) Drewnowski and Scott's Indicator Index;
- c) Sen's Poverty Index;
- d) Atkinson's Measure;
- e) Foigye's Inequality Index;
- f) Kakawani's Poverty Index;
- g) Theil's Information Measure;
- h) Dahuja's Concentration Ratio;
- i) Dandekar's Total Variance Equation;
- j) Sinha's Employment Index;
- k) Sukhatme's Measure;
- l) Reddy and Mitra's Methods;
- m) Subramanyam's Index;
- n) Thon's Index;
- o) Sixth Plan's Methodology.

The purpose of this chapter is not just to review the methodologies but to also arrive at an approach with

minimum limitations and with greatest feasibility considering the data that is available.

(a) Watt's Welfare Ratio (1969):

Watts constructed a poverty index which assigned a higher social value to rise in the lowest incomes than it does to the same increase to households closer to poverty line. He defined the 'welfare ratio' as the ratio of a family's permanent income that is it's long run expected income ( $Y$ ) to the poverty threshold ( $\hat{Y}$ ).

$$\text{In symbols } W = \frac{Y}{\hat{Y}} \quad (\text{I})$$

The two alternative classifications of poor are:

1. On the basis of monetary value of minimum consumable items.
2. On the basis of single important component of levels of living such as food.

(b) Drewnowski and Scott's Indicator Index (1974):

The index given by them was

$$I = \frac{100 (i - i_0)}{100 - i_0} \quad (\text{II})$$

where  $I$  = The satisfaction derived from a given component of level of living.

$i_0$  = The lower critical point at which the satisfaction of the need is at the lowest level.

$i_{100}$  = The level of indicator at which the needs should be reasonably be considered to be fully satisfied and at this level  $i_{100}$  is taken as 100.

(c) Sen's poverty index (1974):

$$\text{Sen's index is } P = \frac{z}{(q+1)nz} \sum_{i=1}^q (z - y_i)(q+1-i) \quad (\text{III})$$

where  $z$  = The minimum acceptable level of income as poverty line.

$q$  = The number of people at or below poverty line .

$n$  = The population size .

$y_i$  = The income of  $i$ th individual arranged in ascending order of magnitude.

(d) Atkinsons' measure (1977):

Atkinson defined a measure based on what he terms "the equally distributed equivalent income  $Y^e$ ". He defines it as the level of per capita income which if equally distributed would yield the same level of social welfare, as present distribution. Atkinson's inequality measure is defined as--

$$A = 1 - \frac{Y^e}{\bar{Y}} \quad (IV)$$

where  $\bar{Y}$  = Current mean income ,

If income is eqully<sup>wa</sup> distributed then

$$Y^e = \bar{Y} \text{ and } A = 0.$$

For any distribution A will be between zero and one.

The measure depends crucially on the social welfare function with which  $Y^e$  is defined. Atkinson's measure is explicitly normative and defines inequality in a way that may not be descriptive of distribution. This measure has the most welfare content and requires the user to specify exactly how he "values" inequality.

(e) Foigyes Inequality Index (1977):

Foigyes<sup>y</sup> inequality indices are based on Lorenz curves:

$$u = \bar{Y} / \bar{Y}_1 \quad (V_a)$$

$$v = \bar{Y}_2 / \bar{Y}_1 \quad (V_b)$$

$$w = \bar{Y}_2 / \bar{Y} \quad (V_c)$$

where  $\bar{Y}$  = The mean income of entire distribution ,

$\bar{Y}_1$  = The mean income of those people with incomes less than  $\bar{Y}$ .

$\bar{Y}_2$  = The mean income of those people with incomes more than  $\bar{Y}$ .

The measure 'v' reflects inequality in entire distribution while 'u' and 'w' measure inequality in respective lower and upper parts of distribution.

(f) Kakawani's Poverty Index (1977):

Kakawani's poverty index makes use of three indicators: the percentage of poor, the aggregate poverty gap and distribution of income among poor, The index as formulated by him is--

$$P = F(X^*) \frac{(X^* - u^*)}{u} \quad (VI_a)$$

Where  $X^*$  = Poverty line

$F(x)$  = Proportion of families having income less than or equal to  $x$ .

$F(x^*)$  = Proportion of poor families in society;

$u$  = The mean income of society.

$u^*$  = The mean income of families having income below poverty line.

P is interpreted as percentage of total income which should be transferred from non-poor to poor so that income of every one below poverty level is raised to  $X^*$  which is generally less than 'u'. When  $X^* = u$  the index P can be shown to reduce to relative mean deviation which is well known measure of inequality.

If the entire population is divided into 'k' mutually exclusive regions such that:

$u_i$  = Mean income of the region.

$f_i$  = Proportion of population in ith region.

$F_i(X^*)$  = Proportion of poor in the ith region.

$u_i^*$  = Mean income of poor in ith region.

$$F(X^*) = \sum_{i=1}^n F_i(X^*) f_i \quad (VI_b)$$

$$u^* = \frac{1}{F(X^*)} \sum_{i=1}^n F_i(X^*) u_i^* f_i \quad (VI_c)$$

Substituting VI (b) and (c) in (a)

$$P = \frac{1}{u} \sum_{i=1}^n u_i f_i P_i \quad (VI_d)$$

where

$$P_i = F_i(X^*) \frac{(X^* - u_i)}{u_i} \quad (VI_e)$$

Equation VI<sub>d</sub> shows that aggregate poverty can be decomposed into different elements. The poverty index P (given by VI<sub>a</sub>, VI<sub>d</sub>, and VI<sub>c</sub>) is not considered ideal as it is insensitive to transfer of income from poor to the relatively more poor within the poverty group.

He defined the ideal poverty index that take account of income among the poor as:

$$P = \frac{F(X^*)}{u} \frac{(X^* - u^*)}{(X^* - u^*)} (1 - G^*) \quad (VI_f)$$

where  $G^*$  is the Gini index of income inequality among the poor and

$$y^* = \frac{2u}{F(x^*)u} \int_0^{x^*} q(x)f(x) dx \quad (VI_g)$$

where  $f(x)$  = Probability density function of family income variable  $x$ ;

$q(x)$  = Proportional income of families having income less than or equal to  $x$ .

The elasticity of poverty index  $P$  with respect to  $G^*$  is

$$\frac{y^*}{P} = \frac{\partial \bar{P}}{\partial g^*} = \frac{u^* g^*}{(x^* - u^*)} + (u^* q^*) \quad (VI_h)$$

which is less than one. The elasticity of poverty index provided information regarding the effect of income inequality among poor.

The lower and upper bounds of poverty index are given by:

$$P < \bar{P} < P + \frac{F(x^*) u^*}{u} \left( 1 - \frac{u^*}{x^*} \right) \quad (VI_i)$$

(g) Theil's information Measure (1977):

Theil had proposed an inequality index based on information theory.

where  $y_i$  = The share of aggregate income going to person 'i' and 'n' = The total number of people.

It is bounded from above by  $\log(n)$ . The larger is 'n' the greater is the amount of possible inequality. The measure satisfies the Pigou-Dalton condition and therefore it is a relative measure.

(h) Dahuja's Concentration Ratio (1981):

Dahuja (1981) has given an index to measure 'inequality' on distribution of assets on the basis of concentration ratio. The range of the ratio is from zero to one. The more equal the distribution, the closer the ratio is to zero and greater the degree of inequality, the ratio is closer to one.

$$CR = \left| \frac{\sum_{i=1}^n A_i}{100 \times 100} \right| \quad \text{(VIII)}$$

where  $\sum_{i=1}^n A_i = (P_j - P_{j-1}) (Q_j + Q_{j-1})$ ;

$P_j$  = Cumulative proportion of household in the jth household group.

$P_{j-1}$  = Cumulative proportion of household in j-1 group.

$Q_j$  = Cumulative proportion of asset/land in jth holding group.

$Q_{j-1}$  = Cumulative proportion of asset/land in j-1 holding group.

## (i) Dandekar's Total Variance Equation (1981):

Dandekar (1981) gave four criteria to define poverty line:

1. the ~~pro~~<sup>o</sup>portion of expenditure taken by specified items such as food;
2. calorie value of food;
3. cost of balanced diet;
4. cost of essentials of tolerable human existence.

Dandekar's total variance ( $\sigma^2 = \sigma_b^2 + \sigma_w^2$ ) forgets that most total variation is in fact intra-individual variation of stochastic stationery kind. He assumes that the variation in requirement of an individual arises from pure chance described by equation:

$$X_t = X + C_t \quad (\text{IX}_a)$$

where error is negligible relative to the unknown true value  $X$ . Available data on other hand show that energy balance and hence intake in an adult individual maintaining body weight and engaged in similar activities from day to day fluctuates with varying amplitudes and varying distances between successive peaks. The auto regressive series is given by:

$$X = P_1 X_{t-1} + P_2 X_{t-2} + \dots + P_t \quad (\text{IX}_b)$$

Thus <sup>h</sup>de does not advance any reason as to why intra-individual variation persists even when the intake is averaged over a week.

(j) Sinha's Employment Index (1981):

According to Sinha (1981) the relationship between employment and income may <sup>take</sup> any form depending on assumption made about the wage rate/earnings per manday. The formula is:

$$C = \frac{E - W}{\bar{P}} \quad (X_a)$$

E = Number person days employed per household.

W = Wage rate.

$\bar{P}$  = Number of persons in household.

C = Per capita expenditure.

Assuming that the labour force participation rates are same for all households, equation (X<sub>a</sub>) can be rewritten as:

$$C = \frac{\bar{T} (1-U) W}{\bar{P}} \quad (X_b)$$

where  $\bar{T}$  = The number of days for persons willing to be in labour force. Thus the relation between 'u' and 'c' depends critically on 'w'.

(k) Sukhatme's Measure (1981):

Sukhatme's (1981) intra-individual variation as a tool of clinical examination, enables to evaluate the incidence of undernutrition in the population by using m-2-w as cut-off point. In this sense, he has used 1900 kilo calories as cut -off point for micro and macro analysis.

(1) Reddy and Mitra's Methods (1982):

The two methods used by Reddy and Mitra (1982) fix the poverty line as:

1. The first method bases the poverty line on an optimum food basket which is chosen by minimising the food cost subject to the fulfilment of nutritional norms. The poverty line is then arrived at by adding to the food cost certain imputed expenditure on non-food articles on the basis of observed behaviour.
2. The second method estimates the relationship between expenditure and calorie intake and arrives at the minimum expenditure to determine the poverty line corresponding to the calorie intake norm.

While the second method arrives at poverty line on basis of existing consumption patterns, the first method addresses itself to the minimum food cost involved in meeting

calorie and other nutritional requirements disregarding the behavioural aspects of the consumer.

The calorie intake of each household is derived from the information on quantities consumed by various households. (The quantities of various food items available from NSS schedules were converted into calories from the conversion tables of National Institute of Nutrition).

Then/the per capita calorie intake is regressed on per capita consumer expenditure using the log-log inverse form of Engel Function:

$$\text{Log } C_i = a_i + b \log E_i + C \left( \frac{1}{E_i} \right) + E_j \quad (\text{XI})$$

where  $C_i$  = Per capita calorie intake of household.

$E_i$  = Per capita total monthly consumer expenditure of  $i$ th household.

$E_j$  = Error term.

The poverty lines corresponding to calorie norms, 2250 calories and 1900 calories are derived by inverse interpolation.

(m) Subrahmanyam's Index (1982):

Subrahmanyam had measured poverty through calorie expenditure. The relationship is given by

$$C = f(x) \quad (\text{XII}_a)$$

Where C = Per capita calorie intake and

x = Per capita total expenditure.

The poverty line  $X^*$  is derived from the above relationship by inverse interpolation.

$$X^* = f^{-1}(\bar{C}) \quad (\text{XII}_b)$$

where  $\bar{C}$  = The calorie level applied.

Once the poverty line is determined, the next step is to measure the incidence of poverty. The headcount and Sen's index are used commonly. The head count measures the proportion of population of households living below the poverty line. This measure is very simple but it does not satisfy the monotonicity and transfer axioms. It is given by:

$$P = \frac{2}{(q+1)nX^*} \sum_{i=1}^q (X^* - X_j) \cdot (q+1-i) \quad (\text{XII}_c)$$

where  $X_i$  = The income of the  $i^{\text{th}}$  unit arranged in the ascending order of magnitude.

$q$  = The number of units below poverty line.

$X^*$  = The poverty line expenditure; and

$n$  = The total number of units.

The NSS provides three different types of data relating to employment, unemployment and those not available for work; firstly information relating to usual activity defined as the one pursued for a relatively longer period

during the last one year is collected; secondly information relating to current activity or activity during the week preceeding the date of interview is ascertained and finally information pertaining to the time-disposition during the week is collected. Using this information <sup>person</sup> per year, <sup>person</sup> week and <sup>person</sup> per day unemployment rates had been computed.

$$\text{person - year unemployment rate} = \frac{U_y}{L_y} \times 100 \quad (\text{XII}_d)$$

$$\text{Person - week unemployment rate} = \frac{U_w}{L_w} \times 100 \quad (\text{XII}_e)$$

$$\text{Person - day unemployment rate} = \frac{U_d}{T_{dw} - N_d} \times 100 \quad (\text{XII}_f)$$

where  $U_y$  and  $U_w$  stand for unemployed persons on the basis of usual current activity respectively.  $U_d$  stands for unemployed days of persons in labour force on the basis of usual and current activity and  $N_d$  stands for days not available for work during reference week.

(n) Thon's Index (1983):

Thon (1983) had defined poverty measure a weighted sum of the form

$$P = \sum_{i=1}^q (x - y_i) w_i(Y, Z) \quad (\text{XIII}_a)$$

where  $w_i(Y, Z)$  is some function which does not depend on  $y_i$  for  $i = q+1, \dots, n$  and where  $X$  is any constant.

He gives the final form of family of poverty measure with single parameter  $c$

$$P_c = \sum_{i=1}^q (z-y_i) \frac{Cn + z - 2i}{(c-1)n^2z} \quad c \geq 2 \quad (\text{XIII}_b)$$

Properties of  $P_c$

$$P_c = \frac{1}{c-1} (P_2 (c-2) (q/n) (z-\bar{y}_p/z)) \quad (\text{XIII}_c)$$

where  $\bar{y}_p$  is the mean income of the poor. So  $P_c$  appears but for a multiplicative constant as sum of two terms. The first term is sensitive to distribution of income of the poor among them. The second term  $(c-2)$  times the product of the head count and the relative income gap is insensitive to the distribution and among the poor. The larger the  $C$  the more the distributional term  $P_2$  gets diluted when  $C \rightarrow \infty$ ,  $P_2$  gets completely lessened and index depends on head count and relative income gap.

(o) Sixth Plan Methodology (1984):

Gupta and Datta (1984) have given the model used in poverty calculation in Sixth Plan.

A. Notation

I. Endogenous variable

1. Gross output;
2.  $I$  = Gross investment;
3.  $I_A$  = Gross investment in Block A;

4.  $I(d)$  = Gross investment by destination;
5.  $Y$  = GDP - at constant market price;
6.  $Y_A$   $Y_B$  (G)  $Y$  = GDP originating in Block. A, B of the economy. in gross and net terms at constant market price.
7.  $C$  = Total private consumption at constant price.
8.  $C_A$   $C_B$  = Total private consumption generated out of the income generation in Block A, B at constant price;
9.  $\bar{C}_A$  = Monthly per capita consumption of all population from the income generated in Block A;
10.  $\tilde{C}_B$  = Additional monthly per capita consumption of all beneficiaries of poverty alleviation programmes in Block B;
11.  $P_{B0}$  = Population living below the poverty line at  $t=0$ ;
12.  $PL_A$  = Population below the poverty line in Block A;
13.  $PL_B$  = Beneficiary population below poverty line in Block B;
14.  $C_{Ar}$  = Total private consumption in the rural area Block A;
15.  $CAu$  = Total private consumption in urban area Block A;
16.  $VAR$   $VAu$  = Monthly per capita rural and urban consumption (block A);
17.  $\lambda^{**}$  = Inequality parameter of lognormal distribution function of the total population (Block A and Block B);
18.  $\mathcal{L}$  = Average propensity to consume (Block A);
19.  $r$  = Post terminal rate of growth of any sector;

## II. Exogenous variable and parameters

20.  $I_B$  = Gross investment in Block B;
21.  $PCa$  = Public consumption in Block A;

22. Pop = Total population (in millions);
23. Pr, Pu = Population rural, urban area (In millions);
24. C\* = Poverty line;
25. b' = Ratio of per capita consumption in urban area to that in rural area;
26. K = Coefficients of capital flow matrix;
27. n = Number of beneficiary families;
28. s = Average size of beneficiary family;
29.  $\lambda\lambda^*$  = Inequality parameter of log normal distribution function referring to consumption distribution of the population Block A and beneficiary population of poverty alleviation programme in Block A respectively;
30.  $\lambda^*$  = average propensity to consume of economy (Blocks A and B)
31. i' = Unit row sector;
32. v = Value added to gross output ratios for all sectors.
33. K = Proportion of subsidy and amortization in the total investment expenditure in poverty alleviation programme;
34.  $\delta_s$  = Sectoral ICOR's;
35.  $w_k$  = Weights of ICOR's of the k activities in the N poverty alleviation programmes;
36.  $a_{ii}$  = Input output coefficient;
37.  $\gamma$  = Factor for vector conversion of consumption scalar in the poverty alleviation programme for the people above the poverty line;
38.  $\beta$  = Factor for vector conversion of consumption scalar in the poverty alleviation programme for people below poverty line;

### III. Other Notations:

39.  $T$  = Terminal Year;  
 41.  $t$  = Time period  $t$ ;  
 42.  $|A|$  = Vector Quantity  $A$ ;  
 43.  $[A]$  = Matrix Quantity  $A$ ;  
 44.  $/$  = Transpose of Matrix;  
 45.  $\wedge$  = Diagonal elements of a matrix.

#### (B) Equations:

##### I. All economy

Set I

$$1. X_T = [B]^{-1} \left\{ e_T + |P e_T| + [K]^A |X_{T-1}| \right\}$$

when in  $K$  matrix all elements in columns  $m$  to  $n$  of the matrix are set at zero since these represent activities having investment gestation lag of less than a year and the elements of the  $B$ -matrix are as: The diagonal elements of ratios of  $B$ -matrix ( $B$ ) are given by

$$1 - a_{11} - k_1 \delta_1 \text{ for } 1 = 1 \text{ to } m \text{ and}$$

$$1 - a_{LL} - k_{LL} r_L \delta_L \text{ for } L = m \text{ to } n \text{ and}$$

the off-diagonal elements of  $B$  matrix are given by

$$-a_{ji} - k_j \delta_j \text{ for all elements } j = 1 \text{ to } m,$$

$i \neq j$  and

for all elements  $j = m$  to  $n$   $i \neq j$

Set II

$$2. X_{i,T} = X_{i,T-1} + \underline{I}_{i,T-1}^{\Delta} \delta_{i,T-1}^{-1}$$

for all sectors;  $i = m$  to  $n$

$$3. X_{j,T} = X_{j,T-1} + \underline{I}_{j,T}^{\Delta} \delta_{j,T}^{-1}$$

for all sectors  $j$ ,  $j = 1$  to  $m$

Set III

$$4. \underline{I}(d)_{j,T} = (X_j - X_{j,T-1}) \delta_{j,T}^{\Delta}$$

for all sectors  $j$ ,  $j = 1$  to  $m$

$$5. \underline{I}(d)_{i,T} = (X_{i,T+1} - X_{i,T}) \delta_{i,T}^{\Delta}$$

for all sectors  $i$ ,  $i=m$  to  $n$  and  $r_{i,T} = r_{i,T-1}$  when  $i = 2$  to  $n$ .

II Block A

Sec IV

$$6. |Y_T| = [\hat{\Delta}] |X_T|$$

$$7. \hat{\Delta} |Y_T| = Y_{AT} + \sum_T Y_{BT}$$

$$8. Y_{AT} = e_{AT} + s_{AT-1} + p_{AT}$$

$$\text{when } e_{AT} = \lambda_T Y_{AT}$$

$$9. s_{AT} = \underline{I}_{AT} + \tilde{k} \underline{I}_{BT}$$

when  $(1 - k)$  is a proportion of investment in Block B comprising of depreciation and amortization for reference period and

$$s_{AT} + (1-k) I_{BT} = i^* |I(d)|$$

$$Y_{B(G)}_t = Y_{Bt} + (1-k) I_{Bt}$$

$$10. \tilde{c}_{At} = c_{At} \div (12^{\Delta} \text{Pop}_t)$$

$$11. P_{LA_t} = \text{Pop}_t^{\Delta} g(z_t^{\Delta}) \quad \text{when}$$

$$z_t^{\Delta} = (\log c^{\Delta} - \mu_t) / \lambda_t$$

and

$$\mu_t = \log \tilde{c}_{At} - \lambda_t^{\Delta} / 2$$

In practice this calculation is done for rural and urban sector separately as detailed below:

$$c_A = c_{Ar} + c_{Au}$$

$$VA_r = c_{Ar} \div (12^{\Delta} P_r)$$

$$VA_u = c_{Au} \div (12^{\Delta} P_u)$$

$$\text{Pop} = P_r + P_u$$

III Block B. Set v

$$12. \sum_i Y_{Bt} = \sum_i (I_{Bt}^{\Delta} \delta_{Bt}^{-1})$$

when

$$\delta_B = \sum_k w_{k} \delta_k ; \text{ and}$$

K = Activities covered in N poverty alleviation programme.

$\delta_{k,t}$  = a subset of  $\delta$  and correspondence to ICORs of the k activities.

$$13. \tilde{I}_{Bt} = \tilde{I}_{Bt}$$

$$14. Y_{Bt} = c_{Bt}$$

$$15. \tilde{c}_{Bt} = c_{Bt} \div (12^{\Delta} n_t^{\Delta} \lambda_t)$$

$$16. P_{LBt} = \sum_i (n_t^{\Delta} \lambda_t)^{\Delta} g(z_t^{\Delta \Delta})$$

when

$$z_t^{\Delta \Delta} = (\log c^{\Delta \Delta} - \mu_t^{\Delta \Delta}) / \lambda_t^{\Delta \Delta}$$

and

$$\mu_t^{\Delta \Delta} = \log (\tilde{c}_A (RP)_{T} + \tilde{c}_{Bt}) - \lambda_t^{\Delta \Delta} / 2$$

## Set VI

$$17. e_A (AP)_t = e_{At} \sum_0^D q \div (Pop_t - P_{LAT})$$

$$18. e_A (BP)_t = e_{At} \sum_0^D q \div P_{LAT}$$

when  $\sum_0^D q = 1.0$ , i.e. the consumption distribution in different expenditure classes is normalised.

$$19. \tilde{e}(T) = [e_A (AP)_T (Pop_T - P_{LAT}) + \frac{\sum_1^T Y_{BT}}{\sum_1^T n_{t-1}} \div (Pop_t - \{P_{LAT} + (\sum_1^T n_{t-1} - P_{LB_T})\})]$$

$$20. \tilde{e}_{(BP)_T}(T) = [e_A (BP)_T P_{LAT} + \frac{\sum_1^T Y_{BT}}{\sum_1^T n_{t-1}} P_{LB_T}] \div [P_{LAT} - \sum_1^T n_{t-1} - P_{LB_T}]$$

$$21. |e(T)_{AP(T)}| = [\hat{\Lambda}]^* | \tilde{e}(T)_{(AP)_T} |$$

$$22. |e(T)_{(BP)(T)}| = [\hat{\beta}]^* | \tilde{e}(T)_{(BP)_T} |$$

$$23. |e(T)| = |e(T)_{AP(T)}| + |e(T)_{BP(T)}|$$

(C) Calculating the Number  $\hat{\Lambda}$  people crossing the poverty line:

In block A the total number of people below the poverty line in period  $t$  comes to  $P_{LAT}$ . Hence the total number of people raised above the poverty line from time period '0' to T will be  $(P_{LO} - P_{LAT})$ . Thus it is defined as growth effect on poverty. In Block B the total number of people among the beneficiaries continuing below the poverty line at time T is  $P_{LAT}^B$ . Hence the number of people raised above

the poverty line in period T due to activities of the poverty alleviation programme is

$$\sum_1^t n_t^* s_t - P_{LBT}$$

This is defined as the 'redistributive' effect on poverty.

In actual calculations, Block B can be subdivided into k number of activities representing N number of programmes each corresponding to different consumption distribution properties and initial incomes of the beneficiaries.

Thus the economy is the aggregate of the total number of people crossing the poverty line at end of time period T will be

$$(P_{L0} - P_{LAT}) + \left( \sum_1^t n_t^* s_t - P_{LBT} \right)$$

and the total number of people remaining below the poverty line would be

$$= P_{LAT} - \left( \sum_1^t n_t^* s_t - P_{LBT} \right) \text{ when}$$

$$Pop_t^* (Z_t^{AAA}) = P_{LAT} - \left( \sum_1^t n_t^* s_t - P_{LBT} \right)$$

$$X^{AA} = (\log c^* - \mu^{AA}) (Z_t^{AAA})^{-1} \text{ and}$$

$$\mu^{AA} = \log c^* - 1^{AA} 2/2 \text{ and}$$

$$C_t = (L_t Y_t - P_{LAT}) (1/2 Pop_t^*) \text{ and}$$

$$L_t^* = Y_t / (C_{At} + C_{Bt})$$

In real life there is no guarantee that resultant attribution will be lognormal and hence the exact calculation of the resultant  $\lambda^{**}$  may not be possible.

After comparing these methods for investigating poverty, the investigator tried out the following methods:

- a. Atkinson's measure;
- b. Drewnokski and Scott's indicator index;
- c. Sen's poverty index;
- d. Foigye's inequality index;
- e. Kakawani's poverty index;
- f. Dahuja's concentration ratio; and
- g. Subrahmanyam's index.

and applied them to the data available for Tamil Nadu for the year 1977-78 with a view to testing and evaluating the more consistent one among these methods.

AN EMPIRICAL VERITICATION OF THE APPROACHES TO  
THE MEASUREMENT OF POVERTY

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## V. AN EMPIRICAL VERIFICATION OF THE APPROACHES TO THE MEASUREMENT OF POVERTY

A careful review of the methodologies used in poverty studies prompted the investigator to apply some of these and check whether they are capable of yielding consistent results. The data chosen for this purpose, the methods applied and the results derived therefrom are discussed under two sections:

- A. Materials; and
- B. Methods and Results.

### A. Materials:

The data for the study related to Tamil Nadu for the year (1977-78) are drawn from various published sources.

They are:

- a. The data on households consumer expenditure from the 32nd Round of National Sample Survey (1977-78);
- b. Agricultural Situation in India (1979);
- c. Tamil Nadu Economic Appraisal (1977-78); and
- d. Tamil Nadu Economic Appraisal (1983-84).

### B. Methods:

The following methods were used to estimate the index of poverty:

- a. Atkinson's measure;
- b. Sen's poverty index;
- c. Foigye's inequality index;
- d. Kakawani's poverty index;
- e. Dahuja's concentration ratio;
- f. Subrahmanyam's index; and
- g. Drewnowski and Scott's indicator index.

a. Atkinson's measure:

Atkinson's measure dealt with the extent of income inequality. The formula given by Atkinson to find out the extent of income inequality is:

$$A = 1 - \frac{y^e}{\bar{y}}$$

Where  $\bar{y}$  = The current mean income;

$y^e$  = The equally distributed equivalent income.

The value of  $A = .80$  (Appendix I). Since the value of  $A$  ranges between zero to one, .80 was interpreted as the extent of inequality in income distribution. Since the inequality is on the higher side, one could infer that a redistribution of the present income could help in improving social welfare.

b. Sen's poverty index:

Sen had given his index of poverty as:

$$P = \frac{2}{(q+1)n^2} \sum_{i=1}^q (2 - y_i) (q+1 - i)$$

where  $n$  = Population size of the State,

$q$  = Number of people at or below poverty line,

$z$  = Minimum acceptable level of income as poverty line.

$y_i$  = Income of the  $i$ th individual arranged in ascending order of the magnitude,

The value of  $P$  obtained was .41 (Appendix II).

Sen's index was derived by using the 32nd Round NSS Survey (1977-78). The value of Sen's index for Tamil Nadu was .41 when set against the index of .14 for All India (Aiyar, 1985) for the relevant period, and this shows that poverty is relatively acute in the State.

c. Foigye's inequality index:

The inequality index was derived by Foigyes as:

$$V = \frac{\bar{y}_2}{\bar{y}_1}$$

where  $\bar{y}$  = The mean expenditure of entire distribution,

$\bar{y}_1$  = The mean expenditure of those people with expenditure less than  $\bar{y}$ ;

$\bar{y}_2$  = The mean expenditure of those people more than  $\bar{y}$ .

The value obtained for  $v$  was 3.33 (Appendix III) implying that the highest per capita expenditure was 3.33

times the mean expenditure of the group which was Rs.50.41.

d. Kakawani's poverty index:

The formula given by him is:

$$P = F(X^*) \frac{(X^* - u^*)}{u}$$

where p = Percentage of total expenditure which should be transferred from non-poor to poor so that expenditure of everyone is raised to expenditure level which defines the poverty line.

u = Mean consumer expenditure of society.

u\* = Mean consumer expenditure of families living below the poverty line,

X\* = Consumer expenditure of the State.

F(X\*) = The proportion of poor families in society.

This measure helps as a strategy to be followed to reduce the poverty gap. The value of P obtained is 55.93 per cent (Appendix IV). It represents the proportion of expenditure that should be transferred from non-poor to poor to reduce the gap between the rich and poor. Besides this, he had also given the upper and lower limits of poverty index as--

$$P < \bar{P} < P + \frac{F(X^*)}{u} u^* \left(1 - \frac{u^*}{X^*}\right)$$

The upper limit calculated was 90.26 while the lower limit was 21.60 (Appendix IV). Since the value of P was 55.93 per cent, it implied that by effective redistribution of expenditure, poverty gap can be reduced.

e. Dahuja's concentration ratio:

Dahuja (1981) used the Gini coefficient ratio in order to measure the inequality of asset distribution. The formula is:

$$CR = \frac{\sum_{i=1}^n A_i}{\sum_{i=1}^n A_i}$$

where  $\sum_{i=1}^n A_i = \frac{100 \times 100}{(P_j - P_{j-1})} (Q_j + Q_{j-1})$

$P_j$  = Cumulative proportion of household in jth household group.

$P_{j-1}$  = Cumulative proportion of household in j-1 group;

$Q_j$  = Cumulative proportion of asset/land in the jth holding group and

$Q_{j-1}$  = Cumulative proportion in j-1 holding group.

The value obtained for CR = .72 (Appendix V). The inequality measure of .72 obtained for asset/land distribution accounted for the inequality in per capita expenditure observed in the State. If poverty were to be tackled at its roots, structural changes like land reforms are

advocated. Unless the basic power structure in the society is altered, it is impossible to eradicate poverty existing especially in rural areas.

f. Subrahmanyam's index:

This index was used to analyse the relation between poverty and unemployment. The formula was:

$$\text{Person week rate} = \frac{Uw \times 100}{\frac{Lw}{7}}$$

The value obtained was 2.13 million (Appendix VI). Thus 2.13 million persons were estimated to be unemployed per week in Tamil Nadu. If employment opportunities could be found for this number, poverty would have been eradicated in Tamil Nadu. Thus the solution to the problem of poverty appeared to depend on providing employment for 2.13 million persons.

g. Drewnowski and Scott's Indicator Index:

The index given by them was:

$$I = \frac{100 (i - i_0)}{i_{100} - i_0}$$

where  $i_0$  = The lower critical point at which the satisfactor<sup>n</sup> of the need is at the lowest level.

$i_{100}$  = The level of indicator at which the needs should reasonably be considered to be fully satisfied and at this level  $i_{100}$  is taken as 100.

This index helps to know the level of satisfaction derived from given component of the level of living. Thus for the State of Tamil Nadu, with the present distribution of consumer expenditure the level of satisfaction achieved was 14.14 per cent (Appendix VII). Thus it is clear that a redistribution in favour of the poor would help in improving the level of satisfaction.

MEASURES FOR THE ERADICATION OF POVERTY



## VI. MEASURES FOR THE ERADICATION OF POVERTY

The solution for the problem of poverty needs to be two pronged to relieve in shortest possible time the intense misery of severe destitutes and destitutes, and to remove the handicaps of poor so that they could contribute more to and share more out of national income and national wealth. Consequently the measures for eradication of poverty are classified as short term and long term measures. Short term measures relate to encouragement to cattle breeding, poultry, spinning, weaving, etc. These have the double potential of providing work at home and increasing household income and also reducing the supply of labour, particularly women in open labour market and thereby tone up general level of daily agricultural wages. Another measure is provision of consumption goods by public authorities. They include supply of drinking water, medical aid, education at elementary level etc. Farmers with tiny pieces of land are encouraged to shift to commercial crops and arrangements for the supply of credit and inputs are made to them. Long term measures encompass<sup>a</sup> all these schemes and programmes that are designed to tackle the problem of underdevelopment. They include further development of allied activities, means of generating employment and higher income and acceleration of development of non-agricultural sectors.

This chapter on measures to eradicate poverty is organised under two major divisions.

- A. A review of the Government programmes towards eradicating poverty; and
- B. A review of the solutions suggested by individual researches towards the solution of the problem.

While one can expect that a considerable number of the suggestions given by the researches as <sup>e</sup>and product of their research would have been hopefully incorporated into the Government programmes for eradication of poverty, an idea of the suggestions that could yet be implemented is also discernible from the second section.

- A. A review of the Government programmes towards eradicating poverty:

During the period of development covered by the first four Five Year Plans, general programmes aimed at improvement of agriculture, development of industries, generation of employment opportunities etc. were undertaken so as to achieve <sup>a</sup>an over all increase in the rate of growth of per capita income. The segment of poor population did not receive any attention in their plans by way of specific programmes meant for lifting them above the povertyline. The Planning Commission made an explicit issue of poverty only from the Fifth Five Year Plan onwards. The Plan

document, for the first time gave the dimensions of the poverty. It was in that plan, poverty level was defined in terms of minimum level of consumption. It identified under-employment and inequality as the twin causes of poverty. It also admitted that the success of all redistribution laws, policies and programme depended on the consent of the poor and the extent of organisations obtaining among them.

The Draft Five Year Plan (1978-83) laid down the objectives which were to be achieved over a period of 10 years:

1. removal of unemployment and underemployment;
2. an appreciable rise in standard of living of poorest sections of population; and
3. provision by State of some of the basic needs of the people like clean drinking water, elementary education, health care, adult literacy, rural roads, housing for landless and minimum services for urban area.

These three objectives were to be achieved by the use of three instruments namely:

1. Resource transfer of and income generating programme for rural poor;
2. Special area development programme; and
3. Work programme for creation of supplementary employment opportunities.

The Planning Commission proposed a shift of resources of favour of programmes with an inbuilt redistributive character. These schemes were:

1. Pilot Intensive Rural Employment Project.
2. The Employment Guarantee Scheme.
3. Food for Works Programme.
4. The National Rural Employment Programme.
5. Training of Rural Youth for Self employment.
6. Small Farmers Development Agency and Marginal Farmers and Agricultural Labourers Development Agency.
7. Antyodaya Scheme and
8. Integrated rural development programme.

1. The Pilot Intensive Rural Employment Project:

This was launched in 1972 as action cum research studies for 3 years in 15 secular blocks of the country. The major activities taken up were roads and minor irrigation works.

2. The Employment Guarantee Scheme:

This Scheme was launched on May 1, 1972 and was first implemented in Maharashtra in 1975. It was undertaken to provide work to the weaker section and so that the work would be productive and ratio of expenditure on labour component to skilled work, supervision, material and equipment

was minimum. The employment generated in 1984 was 562.7 million mandays in Maharashtra.

### 3. The Food for Works Programme:

The Food for Works Programme was started in 1977 and aimed at:

- i. generating employment in rural areas for both men and women;
- ii. creating durable community assets and strengthen the social infrastcuture in order to increase production and raise living standards in rural areas; and
- iii. utilising the surplus food grain for development of countries human resources.

Under this scheme, allocation to different states were made on basis of weightage of 75 per cent given to population of agricultural labourers and marginal farmers and 25 per cent to incidence of poverty. Wages were paid partly in cash and partly in food grains. The additional employment generated was 5336.16 man days in 1979-80.

### 4. The National Rural Employment Programme:

The National Rural Employment Programme is single largest scheme, started in 1977. The thrust of this programme is on creating community assets which will generate

employment and provide sources of income in years. This programme is expected to generate additional employment to the extent of 300 to 400 million mandays per year.

#### 5. Training of Rural Youth for Self Employment:

This scheme was started in 1977-78. The features were to train the rural youth and enable them to undertake projects after considering the cost and returns. The training would be given and stipend of Rs.100/- per month would be given per trainee. Besides, this loans would be provided for their projects at a cheaper rate of interest. Upto 1984, 4.7 lakh rural youth have received training under TRYSEM and more than 50 per cent of these have taken self employment.

#### 6. Small Farmers Development Agency and Marginal Farmers and Agricultural Labourers Development Agency:

To identify the problems of the small and marginal farmers two agencies were set up viz., the Small Farmers Development Agency (1971) and the Marginal Farmers Development Agency. They were expecting to provide short, medium and long terms loans at the low rate of interest. By 1976-77, 103.06 lakh participants were identified. Besides loans even inputs and other things were provided at a subsidised rate.

#### 7. Antyodaya Scheme:

Antyodaya Scheme was initiated on October 2, 1977 as an alternative model for rural development. It was started in Rajasthan to help the poorest of poor first and then help people who are in next grade of poverty. This scheme covered old age pensions, allotment of agricultural land, loans for self employment and professional purposes. Upto 1979, 60,000 families had been covered and credit institution had sanctioned loans worth Rs.12.50 crores as while, the State Government had made provision of Rs.4 crores as subsidy. The subsidy varied from 25 to 33.33 per cent of the likely total cost of investment. As on August 1979, Cooperative banks had sanctioned loans to the tune of Rs.4.38 crores out of which Rs.1.16 crores had been disbursed.

#### 8. Integrated Rural Development Programme:

In 1978-79, one more special programme added, was the Integrated Rural Development Programme. The objectives of this programme were to raise the families above the poverty line and create substantial additional opportunities of employment in rural sectors. This scheme offers assistance for various economic activities to families of 5 persons and with an annual income of less than Rs.3,500/-.

By 1984, Rs.2560/- crores had been invested through IRDP. The capital cost of asset was subsidised to the extent of 25 per cent for small farmers and 33.33 per cent for marginal farmers, agricultural labourers and others. Banks could provide loans upto Rs.5000/- without any security cover or guarantee. Upto 1982-83, the number of families assisted were 22 lakhs and the credit provided was Rs.380.72 lakhs in 1982-83.

As a whole, the success of these governmental programmes depend on:

1. precise identification of rural poor and then felt needs in terms of hierarchy of priority;
2. participatory environment;
3. availability of dependable and reliable information;
4. an effective communication system; and
5. programming technology.

Data on both inputs/outputs outcome are essential for assessing the performance. The problem is that the cost details are available at current prices relating, actual expenditure at current price to targeted expenditure at constant price. The success of any measure depends upon the administrative capacity and action taken at the Centre and State level. Increased centralisation may create

a problem in terms of information, processing and decision making at the top. Inefficient bureaucracy and slow implementation may slacken the progress of these programmes. Thus the centre should play leadership role in problem identification and should assist the State in designing and organising the programmes.

The composition of national product is to be changed in accordance with the priorities meant for the goods and services for the poor and their needs. For this, it is necessary to have an adequate and efficient delivery system that ensures, that the resources allocated as per new priorities are used accordingly and that the benefits of these activities reach targeted section of population.

B. A Review of the Solutions Suggested by Individual Researches towards the Solution of the Problem:

Agrawal's (1981) scheme of action to eradicate poverty consisted of the following steps:

- a. quantify the minimum level to which the poorest in villages should be brought up;
- b. guarantee income and employment to ensure poor with small bits of land and improvement in the productivity of their lands <sup>to</sup> increase their income;
- c. guarantee of employment to those poor who are without any land or other worthwhile assets, except their own capacity to work; and

d. to organise the poor.

In this process, Agarwal wants speedy implementation of land reform and revitalisation of district administration and village level institutions, for diversion of benefits to poor people.

Kripashankar (1980) suggested that resources should be mobilised from affluent sections, banks and other term lending institutions. These could be diverted to improve the infrastructure and to finance productive activities in rural areas. Land reform should be given priority in rural transformation.

Rao (1980) spelled two strategies towards eradication of poverty:

- i. To provide basis minimum needs of the poor in terms of water, health, primary education and environmental sanitation, and
- ii. To make the poor more productive in economic terms and increase their ability to increase their income.

The other suggestions given by him are:

- a. some significant re-distribution should be effected in ownership and operation of productive resources in the country in both rural and urban areas;

- b. reasonable austerity should replace the prevalent conspicuous consumption;
- c. there has to be substantial increase in savings and investment;
- d. inflationary financing of other public or private investment should be brought to an end;
- e. the growth rate of Indian population must be brought down; and
- f. the need for political stability.

Thus, according to Rao, motivation, education, skills and organisations of rural poor constitute the essential conditions for giving success to frontal attack on poverty.

Guhan (1980) has suggested a two fold criteria for evaluating antipoverty programme. He says that these programmes should be judged against the increase in the productive potentialities that they bring about in the levy and also the increase in effective days of employment for the people participation<sup>n</sup> in the programme.

To Jha (1981), the State Financing Corporations should act as catalysis for increasing the opportunities for job expansion. They should

- a. take active efforts to cultivate opportunities;
- b. reduce the sanction disbursement gaps and take up cases of delayed projection;

- c. channelise development for profit; and
- d. function as catalysts in providing the required infrastructure for entrepreneurs.

Sastry (1982) has suggested rural industrialisation as a measure to eradicate poverty through:

- a. smooth supply of raw materials and other input especially to small farmers.
- b. Decentralisation of ownership in management should be the basic principle in the whole village;
- c. provision of infractuctural facilities;
- d. establishment of seperate Research and Development Wing for the development of village economy; and
- e. introduction of Area planning that aims <sup>at</sup> starting service centres, vocational training centres etc.

Giridhari's (1983) package consists of measures for a change in techniques of production and promotion of agriculture and extension of land under cultivation. Specifically he calls for adoption of:

- a. labour intensive and capital saving in the place of sophisticated capital intensive technology;
- b. a rightful place for agriculture as a source of employment opportunities;
- c. a special programme for bringing the barren land, current fellow and cultivable waste land under cultivation.

- d. provision of finance to artisans with meagre income at low rate of interest and training them in modern technology; and
- e. an improvement in the literacy rate.

Chelliah (1983) suggests that the problem of poverty can be tackled through vast programmes of capital works in the country side undertaken in accordance with development priorities.

Appu (1983) recommended the following measures for solving the problem of poverty:

- a. provision of additional employment to agricultural labourers at higher wages;
- b. increased access to land for small, marginal farmers and share croppers.
- c. provision of credit and other supporting facilities to small and marginal farmers for cultivation of land and undertaking subsidiary occupation and
- d. upgrading skills of rural artisans with access to credit and good marketing arrangements.

A review of the solutions to the problem of poverty available in the studies of individual researches have some elements in common. They are:

1. Identifying the target groups;
2. Increasing the resources at their disposal;
3. Providing them the credit and marketing support for raising their incomes;
4. Creating enduring assets in the country through employment offered to them; and
5. Evaluation of the State administration particularly at lower levels.

Many of their suggestions have been incorporated in some degree or other in the programme undertaken by the State and that the time is up for an evaluation of these programmes in the light of their objectives and results achieved.

## CONCLUSIONS AND SUGGESTIONS

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## VII. CONCLUSIONS AND SUGGESTIONS

Poverty is an economic phenomenon associated with low income, poor endowment of family resources and low productivity. Poverty is a curse to the economic development of the country, because of kind<sup>a</sup> of vicious circle is created by economic and social factors.

In this context, the current study was undertaken for reviewing the studies on poverty from 1980-84 in relation to:

1. The definitions and norms used by the researchers;
2. Methodologies adopted by them towards that end;
3. The quantitative estimates derived by them;
4. Any improvement/suggestions contained in the studies for improving the data generating system;
5. Assessment of impact of specific programme on eradication of poverty; and
6. An empirical verification of the different approaches to the measurement of poverty using the data for 1977-78.

Besides reviewing the existing literature on poverty for identifying the operational definitions and methodologies followed by them for studying the problem of poverty, the investigator also empiri<sup>c</sup>ally verified a few of the

approaches to measurement of poverty. Using secondary published sources of information in Tamil Nadu for 1977-78, and with the help of empirical verification, the investigator tried to obtain an understanding of the magnitude of poverty in Tamil Nadu.

The main findings and conclusion of the study are summarised below:

1. It was observed that these studies on poverty that had been reviewed in this investigation had by and large used two approaches namely the absolute poverty and the relative poverty. Absolute poverty was said to exist when people lacked the means to satisfy their basic needs as food, clothing, shelter and maintain his standard of living. Relative poverty, on the other hand <sup>was</sup> judged on the basis of lack of wealth or arising due to maldistribution of resources.

2. The two criteria used in these studies to classify a person as poor are calorie intake norm and consumer expenditure norm.

The requirement of 2400 kilo calories per person in rural areas and 2100 kilo calories per person in urban areas had been used in the Sixth Five Year Plan. The estimates of poor population obtained by Sixth Five Year Plan with this norm was in agreement with those derived by Nutritional

nor Measurement Board (48 percent) and Reddy and Mitra (41 percent). A lower calorie norm of 1800 kilo calories per person was suggested very rarely in research. The second criteria that was used for estimating the extent of poverty was consumer expenditure. The individual writers have given their estimates about the per capita consumer expenditure. When calculated on this basis, no significant difference was observed between the official and individual estimates of poor population. The studies, regardless of the norms used have shown that the proportion of population below the poverty line had continued to rise during the period of the study.

3. A review of the methodologies made it clear that as many as fifteen approaches had been used by the researchers in their attempts at quantifying poverty, of which some of them like the Watts 'Welfare ratio' measure presumed the existence of common social welfare function for indicating the extent of redistribution of per capita income desired for improving the level of social welfare with existing incomes. The practical validity of these methods was, therefore, limited. Others were down to earth, pragmatic which could be used with the type of data, that was already existing.

4. The specific methods used for analysing the extent of poverty in Tamil Nadu in the study were:

- a. Atkinson's measure which helps to know the extent of inequality in the present distribution of income;
- b. Foige's inequality index which reflects the inequality of expenditure in entire distribution;
- c. Kakawani's poverty index which estimates the poverty gap;
- d. Dahuja's concentration ratio <sup>which</sup> measures the extent of inequality in distribution of assets;
- e. Subrahmanyam's index which gives the relationship between the incidence of poverty and unemployment.
- f. Sen's index which gives the extent of poverty of the people living below the poverty line and
- g. Drewnowski and Scott's indicator index <sup>which</sup> helps to know the level of satisfaction obtained from a given component of a level of living.

The conclusions drawn on the basis of these results are:

- i. Poverty was acute in the State as indicated by Sen's index, .41 against .14 for All India.
- ii. The extent of inequality in income distribution was .80 and the extent of inequality in asset/land distribution was .72.

- iii. An analysis of the relationship between poverty and unemployment showed that 2.13 million were unemployed per week in the State.
- iv. In order to reduce the poverty gap, 55.93 per cent of consumer expenditure should be transferred from non poor to poor.
- v. With the present distribution of consumer expenditure, the level of satisfaction obtained, was only 14.14 per cent.
- vi. The results obtained by using Foigye's index was 3.33, implying that the highest per capita expenditure was 3.33 times the mean expenditure of the group which was Rs.50.41.

A review of the findings on poverty in the State of Tamil Nadu indicates that no one index of poverty is complete by itself. It has to be combined with the other indices to obtain a complete understanding of the extent and causes of poverty and measures thereof for eradicating it.

5. A review of the measures and suggestions made towards eradication of poverty revealed that any programme to eradicate poverty should have these elements.

1. Identifying the target groups;
2. Increasing the resources at their disposal;
3. Providing them the credit and marketing support for raising their income;

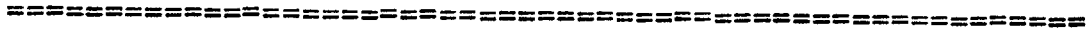
4. Creating enduring assets in the country through employment offered to them; and
5. Evaluation of the State administration particularly at lower levels.

Conclusion:

A review of these studies may not be adequate to give a true and an impartial picture of poverty. The extent of poverty and accentuating imbalances between the urban and rural areas has resulted in giving more emphasis for the poor. Poverty being a subjective concept makes it difficult to compare or specify a uniform pattern of consumption behaviour.

Thus any further studies on poverty should consider the variations in food consumption among individuals, among regions and the rate of growth of inflation as explanatory variables in arriving at the extent of poverty.

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APPENDICES

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APPENDIX I

ATKINSON'S MEASURE OF INEQUALITY

$$A = 1 - \frac{y^e}{\bar{y}}$$

$\bar{y}$  = The current mean income..

$y^e$  = The equally distributed equivalent income.

Based on the State income data provided in the Tamil Nadu Economic Appraisal (1977-78):

$$\bar{y} = \text{Rs.}82$$

$$y^e = \text{Rs.}657$$

$$A = 1 - \frac{82}{657}$$

$$= .80$$

APPENDIX II

SEN'S POVERTY INDEX

$$P = \frac{2}{(q+1)nz} \sum_{i=1}^q (z - y_i) (q+1-i)$$

where n = Population size of the State.

q = Number of people at or below poverty line.

$y_i$  = Income of  $i$ th individual arranged in ascending order of the magnitude.

z = Minimum acceptable level of income as poverty line.

On the basis of 32nd Round of NSS data on consumer expenditure (1977-79) the information provided as follows:

Monthly per capita expenditure class (in rupees)	Estimated number of persons
0-50	20409565
50-100	20653045
100-150	3696584
150-200	1008836
200-250	624970
Total	<u>46393000</u>

$$\begin{aligned}
N/2 &= 4639300/2 \\
&= 23196500 \\
y_c &= 50 + \frac{23196500 - 2049565}{20653045} \times 50 \\
&= 50 + \frac{21146935}{20653045} \times 50 \\
&= 50 + 1.02 \times 50 \\
Y_i &= 101.19 \\
n &= 48.41 \\
z &= \text{Rs.}.88 \\
q &= 41062610
\end{aligned}$$

Substituting in the formula we get:

$$\begin{aligned}
P &= \frac{2}{(41062611) (48.41) (88)} \times (984-101.19) \times (41062611) \\
&= \frac{1745.62}{4260.08} \\
&= .41
\end{aligned}$$

APPENDIX III  
FOIGYÉS INEQUALITY INDEX

The formula given by him is:

$$V = \frac{\bar{Y}_2}{\bar{Y}_1}$$

where  $\bar{Y}$  = The mean expenditure of entire distribution.

$\bar{Y}_1$  = The mean expenditure of those people with expenditure less than  $\bar{Y}$ .

$\bar{Y}_2$  = The mean expenditure of those people more than  $\bar{Y}$

The data used to obtain the value of "v" was from the 32nd Round of NSS consumer expenditure (1977-78).

Monthly percapita expenditure (in rupees)	Estimated number of persons
0-10	9153
10-20	236677
20-30	3222649
30-40	8067270
40-50	8873816
50-75	14753102
75-100	588943
100-150	3696584
150-200	1008836
200-250	624970
	-----
Total	46393000
	-----

$$\begin{aligned} \bar{Y} &= A + \frac{\sum fd'}{N} \times c \\ \bar{Y} &= 125 + \frac{-69213399}{46393000} \times 50 \\ &= 125 - 74.59 \\ \bar{Y} &= 50.41 \end{aligned}$$

$$\begin{aligned} \bar{Y}_1 &= 25 + \frac{9479917}{20409565} \times 10 \\ &= 25 + 4.64 \\ &= 29.64 \end{aligned}$$

$$\begin{aligned} \bar{Y}_2 &= 125 - \frac{18394269}{34983435} \times 50 \\ &= 125 - 26.28 \\ &= 98.72 \end{aligned}$$

$$\begin{aligned} \therefore v &= \frac{98.72}{29.64} \\ &= 3.33 \end{aligned}$$

## APPENDIX V

### DAHUJA'S CONCENTRATION RATIO

It is given as:

$$CR = \frac{\sum_{i=1}^n A_i}{100 \times 100}$$

where  $\sum_{i=1}^n A_i = (P_j - P_{j-1}) (Q_j + Q_{j-1})$ .

$P_j$  = Cumulative proportion of households in  $j$ th household group.

$P_{j-1}$  = Cumulative proportion of households in  $j-1$  group.

$Q_j$  = Cumulative proportion of asset/land in the  $j$ th holding group.

$Q_{j-1}$  = Cumulative proportion in  $j-1$  holding group.

The source of the data is the details about the distribution of land assets of cultivator households found in Agricultural Situation in India (1979).

DISTRIBUTION OF SELECTED CULTIVATION HOUSEHOLDS AND OPERATED  
AREA ACCORDING TO OPERATIONAL HOLDING GROUP (1977)

Operational holding in hectares	Number of households	Percent	Operated area in hectares	Per cent
.01-.50	34	34.00	8.86	5.10
.51-1.0	21	21.00	14.97	8.62
1.01-2.0	21	21.00	28.87	16.63
2.01-3.0	9	9.00	20.74	11.95
3.01-5.0	6	6.00	23.04	13.27
5.01-10.00	6	6.00	42.17	24.29
Above 10	3	3.00	34.96	20.14
Total	100	100.00	173.61	100.00

The Cumulative frequencies obtained are:

Operational holding in hectares	Per cent of household	Cumulative per cent	Percent of operated area	Cumulative frequencies
.01-.50	34.00	34.00	5.10	5.10
.51-1.0	21.00	55.00	8.62	13.72
1.01-2.0	21.00	76.00	16.63	30.35
2.01-3.0	9.00	85.00	11.95	42.30
3.01-5.0	6.00	91.00	13.27	55.57
5.01-10.0	6.00	97.00	24.29	79.86
Above 10	3.00	100.00	20.14	100.00

The respective values are

$$R_j = 55.10$$

$$R_{j-1} = 34$$

$$Q_j = 79.86$$

$$Q_{j-1} = 55.57$$

$$\therefore A_j = (P_j - P_{j-1})(Q_j + Q_{j-1}) / 100 \times 100$$

$$= \frac{(55.10 - 34)(79.86 + 55.57)}{100 \times 100}$$

$$= .28$$

$$= .28$$

$$\therefore CR = 1 - .28$$

$$= .72$$

## APPENDIX IV

### KAKAWANI'S POVERTY INDEX

The index as given by him is

$$P = F(X^*) \frac{(X^* - u^*)}{u}$$

$P$  = The percentage of the total expenditure which *should* be transferred from nonpoor to poor.

$u$  = Mean consumer expenditure of society.

$u^*$  = Mean consumer expenditure of family living below poverty line.

$X^*$  = Consumer expenditure.

$F(X^*)$  = The <sup>o</sup>portion of poor families in society.

The source of the data is the 32nd Round of NSS on consumer expenditure for Tamil Nadu (1977-78).

Corresponding values obtained were

$$\begin{aligned} u &= 125 - \frac{692133901}{46393000} \times 50 \\ &= 125 - 74.59 \\ &= 50.41 \end{aligned}$$

$$\begin{aligned} u^* &= \frac{2059217500}{41062610} \\ &= 50.14 \end{aligned}$$

$$X^* = 82$$

$$\begin{aligned} F(X^*) &= \frac{41062610}{46393000} \times 100 \\ &= 88.51 \end{aligned}$$

Substituting in the formula we get

$$P = 88.51 \frac{(82-50.14)}{50.41}$$
$$= 55.93$$

To calculate the upper and lower limits of poverty the formula used was

$$P < \bar{P} < P + F \left( \frac{X^*}{u} \right) u^* \left( 1 - \frac{u^*}{x^*} \right)$$

$P + \frac{F(X^*)}{u} u^* (1 - u^*/x^*)$  is the upper limit

$$= 55.93 + \left\{ \frac{88.51}{50.41} \frac{50.14}{50.41} \left[ 1 - \frac{50.14}{82} \right] \right\}$$

$$= 55.93 + 34.33$$

$$= 90.26$$

The lower limit is  $55.93 - 34.33$

$$= 21.60$$

Thus 55.93 lies between 90.26 and 21.60.

APPENDIX VI  
SUBRAHMANYAM'S INDEX

The formula is

$$\text{Person week rate} = \frac{(Uw/Lw \times 100)}{7}$$

Uw = The number of unemployed persons on the basis of current activity.

Lw = The labour force in current activity.

The data is obtained from the Tamil Nadu Economic Appraisal (1983-84):

$$Uw = 28209287$$

$$Lw = 19026393$$

$$\begin{aligned} \text{Person week rate} &= \left[ \frac{28209287}{19026393} \times 100 \right] \div 7 \\ &= 2.13 \text{ million persons} \end{aligned}$$

## APPENDIX VII

### DREWNOWSKI AND SCOTT'S INDICATOR INDEX

The index given by them was

$$I = \frac{100 (i - i_0)}{i_{100} - i_0}$$

$i_0$  = The lower critical point at which the satisfactor of the need is at the lowest level.

$i_{100}$  = the level of indicator at which the needs should reasonably be considered to be fully satisfied and at this level  $i_{100}$  is taken as 100.

$I$  = The satisfaction derived from a given component of level of living.

Based on 32nd Round of data on consumer expenditure (1977-78), the value of  $I$  obtained is as follows:

$$i = 50 + \frac{243480}{1719141} \times 50$$

$$= 50 + 7.07$$

$$= 57.07$$

$$i_{100} = 100$$

$$i_0 = 50$$

Substituting in the equation

$$I = \frac{57.07 - 50}{50} \times 100$$

$$= 14.14$$