CHAPTER III
Poverty as a concept is closely related to inequality and it could be associated with the problem of unemployment. With the given average income level, the inequality is high and this could be associated with higher level of poverty. Dandekar and Rath suggested the expenditure of Rs.27 per capita (at 1968-69 prices) per month and that should be regarded as nationally desirable minimum. When this is accepted it gives us a norm of adequate employment level in terms of earnings. This requires that the men labour should earn a daily wage of Rs.2.42 and female labour gets a share of Rs.1.61. Dandekar and Rath defined poverty "we thus get an independent verification of the minimum level of consumer expenditure as suggested and a support for the contention that an adequate level must be defined in terms of its capacity to provide minimum living to the population.

The poverty line is associated with higher level of inequality. The line may be drawn in the light of socially accepted minimum standard of living.

Poverty is a well known phenomenon and yet there is no unanimity about its definition. It can be regarded as a fact or an attribute of a person, persons, a household or groups of households. It becomes a problem when it is considered undesirable either by the concerned person or by others. It indicates deprivation of some sort or the other. But there is no unanimity as to what constitutes poverty. Some people may be so poor that it would be easy to identify them irrespective of the definition adopted: problems, however, arise with respect to those who may be classified as poor according to one definition and not so according to another. Even that may not be significant at macro level for a country like India but it becomes important at the micro level.

Absolute Poverty:

The absolute poverty is measured in terms of some kind of notion of subsistence considered appropriate to the circumstances of the country. Poverty in a way is highly subsidising phenomenon since it depends upon a feeling of deprivation for something for which an individual may be having a strong desire. Such an approach though important from the point of view of our individual, is, however, not useful as an instrument of social policy. For this purpose, poverty should be conceived in terms
of human needs which are considered essential by the society and are capable of being measured objectively. A person may be regarded for example as poor if he is not in a position to meet his basic needs.

It is well known fact that human wants are unlimited, both material and non-material. The fulfilment of his need requires food, clothing, shelter which are generally well defined in a social set up. Non-material needs comprises elements like family atmosphere, sense of belonging security etc. However, all the needs are not of equal importance. In general, material needs are more important than anything else. In view of the importance of material needs, poverty has been defined in usual terms. The reasons for laying stress on material needs are that it is possible to evolve a social consequences on a basket of such needs and take appropriate policy measures to meet their requirements.

The concept of absolute poverty implies non-fulfilment of the determined material needs which was considered essential for human beings. The measurement involves stipulation of a minimum level of per capita consumer expenditure which is enough to get his needs satisfied. The persons whose expenditure is less than the figure of those stipulation is pitiable/pathetic.
The application of this concept which is widely used in our country is, however, not free from problems. The difficulties arise primarily with respect to what is to be included under essential needs. Some economists confine themselves to food. Others include additional items like shelter, health and education. The then President of World Bank, Mr Robert S McNamara, regards poverty "a condition of life of characterised by mal nutrition, illiteracy, disease and low life expectancy as to be beneath any reasonable definition of human decency". Even with respect to food, there are differences on account of different norms of per capita requirement.

Questions related to the poverty arise regarding the validity of using single figure of average per capita expenditure for the population as a whole. The simple approximation that can be used is by assuming a distribution of the minimum needs.

Relative Poverty:

The concept of poverty is relative. Between two households or two persons, one may be considered as poor while the other in comparison may not be so even though both may be in a position to fulfil their basic material needs. To estimate the number of people below the poverty line, according to this approach, the whole population of
a country will be stratified on the basis of income and then the standard of living of the lowest and highest income groups will be compared. Persons having standards of living below the cut off points will be identified as poor. For example, the cut off point may be fixed at half the median point of the distribution or it could be measured in terms of full dispersion between the highest and lowest standards. According to Prof Peter Townsend "the needs which are believed to be basic or absolute may be shown to be relative and suggest that poverty must be regarded as a general form of relative deprivation which is the effect of the mal-distribution of resources, that section of the population whose resources are depressed from the mean as to be deprived of enjoying the benefits and participating in the activities which are customary in the society can be said to be in poverty".

The measure of relative poverty is in fact a measure of inequality in the distribution of income. In this case it may exist even when all the households are in a position to fulfil their basic needs both in rich and poor country.

POVERTY AND INEQUALITY

Concept of Poverty:

The problem of poverty is not new to any one. It has been there over years not only in India but throughout the world - no country is free from this acute problem. Even USA and UK have been facing this problem. Poverty as a concept is closely related to inequality and this problem can be associated with the family where more number of persons are unemployed.

Poverty has been defined in various ways by the economists and sociologists. Peter Townsend* has defined the concept of poverty as a system in which there will be continuous fight for unemployment. If people are employed atleast they will not fall below the poverty line.

To begin with, we find that there are two major problems on which the concept of poverty is defined. They are the problem of identifying the 'poor' and the problem of 'measurement'. To understand this, a number of studies have been made in India.

In United Kingdom the first attempt was made further by Young+ to estimate the extent of poverty during the second half of 18th century. Rowntree in the year 1899

* Ibid.
estimates 10% of the population in New York in primary poverty and 18% of the population was in secondary poverty.

Rowntree\(^2\) was of the opinion that poverty is of two types, i.e., primary and secondary poverty. The primary poverty was defined as the person whose income was less than their optimum requirement to purchase their basic food item, clothing, shelter, etc. The secondary poverty where because of the wasteful expenditure and failure to acquire basic requirement, the people were in the poverty group. Many of the developed countries have reached a stage where all their citizens have attained higher standard of living than the prescribed minimum and still considerable inequality prevails in the distribution of income and wealth.

The relative poverty arises mainly as an unequal distribution of income irrespective of what the income level or the corresponding state of deprivation of the people. Whereas the absolute poverty is a collective view of deprivation. It is therefore, relative poverty is inextricably measured along with inequality, whereas the

absolute poverty depends on the poverty line which represents a socially acceptable minimum level of living.

Orshansky\(^3\) also defined the concept of poverty on the same line as defined by Rowntree. Rowntree adopted the minimum requirements of protein and calorie while minimum food expenditure was used to estimate the poverty in the study made by Orshansky.

The intensity of the poverty in UK was reduced during the post second world war years since the Government came forward to extend some benefits to unemployed, the family was getting extra allowance to support the dependent children and supplementary were made available to push them above the starvation line.

The Census Bureau estimates that the percentage of poor has increased and increasing to a great extent. In the year 1975 the figure rose by 2.5 million and that rise was recorded to be the highest since 1959. The reason behind this alarming figure could be related to recession and unemployment.

In developing countries while understanding the extent of poverty another point has emerged to be called

fourth world. Out of 97 developing countries, 55 belong to the third world and the fourth world countries consist of 25 American countries, 11 Asian countries, 4 Latin American countries and 2 Island countries.

The ILO report reveals that poverty is terrifying us. According to this estimate nearly 40% of the population of developing countries was not employed through the year.

It is true that in developing countries, the top 10% of households typically receive about 40% of personal income, whereas the middle 40% receive around 15% and the bottom 20% receive about 5%.

Poverty in India: A Historical Survey:

In India many studies have been made and many estimates are done. This was made in order to understand the magnitude of poverty. In India, during 1870 the per capita annual income was as low as Rs.20/- as estimated by Dadabhai Naoroji. When Mr Akinson estimated that figures was around Rs.31/- for the year 1875. Lord Curzon


estimated the per capita income was not less than Rs.30/- in 1901. Finlay Shirrahs estimate of per capita income was Rs.116/- in 1920. During the depression year the per capita income dropped to Rs.58/- in 1932 and this figure was as high as Rs126 in 1924. Another study was made for the year 1931-32 by Dr V K R V Rao and his estimate was Rs.62/-.

Though these surveys were made, they do not describe which section of the society was poor. The per capita income was on the increasing at the rate of Rs.2/- per annum, i.e., from Rs.20/- in the year 1870 to Rs.160/- in 1947-48.

In the year 1960, P C Mahalanobis headed a Committee to review the standard of living. The Committee came out with a view that huge population belonging to the lowest 10% were poor at the close of second plan.

Planning Commission used the norm of Rs.20/- at 1960-61 prices as the poverty living on per capita monthly basis. In this study there was no distinction between rural and urban areas. The estimated per capita expenditure was the expenditure excluding health and education. This was done as these are provided by the State.
Whereas B S Minhas using the norm fixed by the Planning Commission required the income limit for rural area to Rs.200 per annum and estimated the percentage of population and it has decreased to 154 million but this figure was 210 million when the Planning Commission norm was used (in terms of percentage it reduced from 50.6 to 37.1) for the year 1967-68.

Bardhan used a norm of Rs.15/- per month for rural area at 1960-61 prices and estimated that about 38% of the total rural population lived in poverty during 1960-61 and at the same price the percentage of the population for 1968-69 estimate at around 54%. The agricultural labour consumer price index was used by Bardhan to workout the rural per capita consumption and the figures were arrived for different years.


Bardhan's estimate was open for criticism that he has used the Consumer Price Index for Agricultural Labourers because others argued that rural poor does include not only agricultural labourers but also small farmers. Bardhan in his calculation used the lower figure of Rs.15/- due to the reason that he has excluded the expenditure on vegetables, education, health, etc., on the one hand and on the other hand before using NSS based average retail prices. He thinks that the average rural consumer does not procure all his consumption needs from the market and part of his requirement will be grown in his own farm.

Dandekar and Rath estimate more or less compares favourably with Bardhan estimates as regard to the rural population. Gopalan and others used minimum calorie requirements and estimated the poverty for India on the basis of the type of work carried out by them i.e., light, medium and hard work.

According to another study made by Vaidyanathan, around 16% of the total population were living in the


poverty group and this was worked out at 1960-61 prices, i.e., 21.44 as average per capita consumption.

Another study is based on the approach of Sen's poverty index. This study was carried out by Bhattky in the year 1974 and he used Sen's poverty index and Head Count method to estimate the incidence of poverty in various occupational groups of rural area.

The incidence of poverty is more among the agricultural labourers followed by non-agricultural labourer and cultivators. According to Bhatty when he worked out the estimates, it proved to be far below the estimates made by Bardhan, Dandekar, Rath, Minhas and Ojha while the estimates of Vaidyanathan's and Bhatty more or less, compared favourably i.e., Rs.180/- per annum.

Another study is on the price variation, type, nature of activities and cropping pattern was excluded and here estimate was made by adopting the uniform measure of poverty. Mukherjee while doing this, ranked the

population by per capita expenditure and mapped the poorest 10% of rural population and found Orissa, Kerala, Bihar, Mysore and Andhra Pradesh were poor states (1963-64).

In a recent study, Ahluwalia\textsuperscript{13} examined trends in the incidence of rural poverty for 22 years i.e., from 1956-57 to 1977-78. He used these figures in order to measure the extent to which people fall below poverty line in India and the study carried out by Narain,\textsuperscript{14} poverty levels in rural India have fluctuated extraordinarily over time from 40% to 60% of the rural population. In the case of Narain analysis it proved to be that there is decreasing trend in rural poverty. The index prepared on rural poverty shows that the income of the poor is not at all increasing because of rising prices and lack of employment. This can be cross checked with per capita net availability of food grain.

Planning Commission concluded that 47\% of rural population in India fall below the poverty line, i.e., an estimate made for the year 1977-78.


\textsuperscript{14} \textit{Rural India, January}. Montek S. Ahluwalia.
On the basis of the data collected by NSS, in its 38th round, a rough estimate was prepared; about 41.3% of the rural population was living below the poverty line in 1983. For the same year when the data of NSS were processed by Planning Commission, it was 40.4 for the rural area and for all India the total percentage of population that lived below poverty was around 37.5 i.e., approximately 269 million people. Planning Commission figure was slightly lower than NSS estimates. The proportion of rural poor was as high as 51.5% in the year 1972-73 and it came down to 37.4 in 1983.

The Planning Commission concluded that 36 million people (10.9%) have crossed the poverty line.

The Planning Commission also envisaged that with present standard of living, the poverty percentages would go down still from 36.9 in 1984-85 to 25.8% by the end of 1989-90; in absolute number the poverty population would fall by 62 million (i.e., from 273 to 211 million).

The reliable data was available in sixth plan document which placed a high priority on the alleviation of poverty.
From this it is understood that the incidence of poverty has been varying over the years. When the season and harvesting is good, the level of living also goes up and this could not be in favour of labourers and cultivators when rainfall and harvest is not good. Since foodgrains constitute a major part of the expenditure of household the standard of living goes up in good years and move down in bad harvesting years.

When output was 152.4 million tonnes the percentage of poverty was 42.6. In 1984-85 the output remained at 146.2 million tonnes and would this mean that poverty percentage will go up (more than 42.6) instead of fall as estimated by Planning Commission. This is difficult to prove as the consumer expenditure data is not available.

So far we confined our attention to the problem at the national level. Do the data available for the states to draw the conclusion on par with the all India studies. Whether the incidence of poverty is severe or has it gone up more severely in some states than others? Does the result prove substantially the rich and poor image of the state/region. To understand this a few studies are
available made by Panikar, and Rajaraman.

In determining the magnitude of poverty on calorie intake basis Iyengar and Gopalakrishnan (1985) in a study on Karnataka used the norm suggested by Nutrition Expert Group which incidentally matches with the recommendations of FAO was used to estimate the poverty. Using this norm to estimate, they found the poverty line for rural population at Rs.52.72 at 1973-74 prices.

The methodology and data used to estimate poverty was examined by a group of experts set up by CSO and Planning Commission in the year 1985-86. B S Minhas came out with a suggestion to update the estimates through appropriate correlations for inflation. Another suggestion was made by the Planning Commission to construct a poverty line for different states in India in monetary terms.


Sastry and Suryanarayana,\textsuperscript{19} (1981) worked out this minimum diet for an adult. The expenditure on the starvation line was defined as poverty line by Rao (1981). Rao and Vivekananda (1982) suggested a new 'surplus' criterion to measure the extent of poverty.

Ahluwalia\textsuperscript{20} noticed inverse relationship between output of agriculture and poverty of rural population. Mahendroden\textsuperscript{21} (1982) noticed a valuable relation between productivity and poverty of rural area. Sanyal (1988) was of the opinion that poverty is prevailing due to tremendous change in the ownership of land due to fragmentation. Prasad,\textsuperscript{22} (1986) found that poverty could be reduced if farmers adopt high yielding varieties.

Iyengar and Vani\textsuperscript{23} used a practical measure to estimate the degree of inequality through standard errors.

\textsuperscript{23} Iyengar, NS and Vani, B P: 1986, "The Extreme Disparity Ratio and Its Economic Implications: An Illustration from NSS Data", ISI Economic Analysis Unit, Discussion Paper.
and found that the variation was big for the year 1983-84 with the base year 1973-74. The total per capita consumption rose by 118.0 per cent and proportion of the amount spent on food dropped from 74.9 to 65.4. Expenditure on items other than food i.e., mostly on clothing etc., it went up by 13.5 per cent. The growth rate of per capita consumption faster among rich class and the process was slow in the case of poor families.

Measurement of Poverty

Sen\textsuperscript{24} stated that there are two categories in the economic literature used to measure the inequality. Firstly the statistical technique like range, mean, deviation, the variance and co-efficient of variation. S D Lorenz Curves and Gini Co-efficient and Sen's index. Secondly there are some measures to measure inequality in terms of some normative notion of social welfare.

Among above mentioned, the range ignores the distribution between the extremes and the relative mean deviation is not at all sensitive. The variance as a measurement of inequality is insensitive to income transfers. The co-efficient of variation and Gini co-efficient fulfil

the Pigou,\textsuperscript{25} Dalton\textsuperscript{26} condition. The lorenz curves show the percentage of income received by the bottom 20\% of the population with $x$ varying from 0 to 100. The big advantage of this is that it compares with levels to social welfare without specifying anything very particular about the exact welfare function. Higher lorenz curve implies a more equal distribution in strictly objective sense.

In Lorenz curve, the size of items and the frequencies are both cumulated and taking the total as 100, percentages are worked out for the cumulated values. On different values if proportionate equal distribution is there, the points would be a straight line. This line is called the "Line of equal distribution". Farther the curve is from this line, greater is the variability.

The main drawback of Lorenz Curve is that it does not give any qualitative/numerical value of the extent of inequality and hence it should be used along with


quantitative measure of inequality.  

The Gini Co-efficient is more opaque since it measures the distance between the diagonal line of equal division and the Lorenz curve. Unlike the Lorenz curve, the Gini co-efficient always conclusive since one real number must be greater than, equal to or less than another. Gini-Co-efficient may be written in the following form:

Gini Co-efficient:

\[ G(y) = 1 + \frac{1}{n} - \frac{2}{n^2} \sum_{i=1}^{n} \left( y_i \right) \frac{1}{n+1} \]

G  Gini Co-efficient  
Y  Income  
\( y_i \)  Income of \( i \) th person  
I  \( i \) th poorest men  
Z  mean income  
n  population size

Sen's measures of poverty\(^{30}\) is sensitive to the gaps in the income of the poor. Sen's poverty measure

30. Ibid.
\[
Ps = \frac{\sum_{i=1}^{2} (z - y_i) (Q^*+1.-1)}{(Q^* + 1)n_2}
\]

\(Q^*\) The number of people below poverty line

\(Z\) Poverty level

\(n\) Population size

\(y_i\) Income of the \(i\)th person

For estimating \(Ps\), income differences are calculated from the poverty line and not from the mean income of the distribution. The Sen's measure and the Gini measure has distinguishing features:

1. It lowers only a part of the distribution.
2. It is an absolute measure.

The latter makes an unambiguous welfare adjustment.

Over years a considerable body of quantitative information of inequalities in living standards has been accumulated. The most important source is the NSS which provides data on the average per capita consumption and its distribution in rural and urban areas. The NCEAR survey give estimates of income distribution to the national level.
In some other studies, on inequality in living standards in rural India, the differences were found to be very serious. Most of the economic thinkers have used Lorenz ratio while dealing with the problem and according to them the results varies between 0.29 to 0.47. But in another study conducted by NCAER the result differs from other surveys in sample design and concepts. Estimates of income inequality were processed from the raw data collected by NSS.

The difference in the distribution of income and consumption have been widely discussed in two papers by Mukherjee and Chatterjee and another by Swamy. The first two authors concluded that disparity in distribution of consumption expenditure will reduce at current price.

The estimate of inequalities in real consumption is usually derived by deflating the per capita expenditure in several classes and this procedure is open to criticism on two grounds. According to Swamy\(^3\) at current prices inequalities in consumption in the second plan were larger than the I Plan and this estimate suggests that inequalities remain more or less stable in rural areas but increased

In urban areas.

Recently, a number of authors have attempted to assess the change in the incidence of poverty between 1960-61 and 1967-68. Ojha and Bardhan argue that there is an increase in the proportion of population who are falling below a specified required consumption standard.

B S Minhas thinks in the opposite direction and according to him the number has been reducing and this controversy is because of the differences in the methods of adjusting prices.

INCOME

The concept of income is essentially relative. The relativity of the income concept implies that the appropriateness of the concept of income is not independent of the purpose for which it is to be used. In evolving a concept of income appropriate for data on income distribution, the productivity basis of national income

aggregate needs to be clearly borne in mind. The discussion of the concept of income in economic theory proceeds from the viewpoint of production and distribution and has no direct application to the problem of personal income. Marshall, for instance, adopting the social, in contrast with the individual, point of view regards income primarily as a measure of the production of the community as a whole. In conformity with the approach to the problem in theory, Kuznets Simon regards national income estimates as being designated to measure the end product of a country's economic activity, reflecting the combined play of economic forces and serving to appraise the prevailing economic organisation in terms of its return.35

Kuznets later describes incomes associated with full time full fledged participation in economic activity as incomes of mature expenditure units, but labour force participation varies between men and women. While the distribution of earnings of all adult males is roughly similar to the earnings of full period male workers, for females the two are quite different. Given the positive correlation between earnings of husbands and wives, to exclude women from distribution is to ignore the fact that

voluntary unemployment or short time working of married women reflects the family expenditure units preference for leisure as income of the family rises.

Emphasis on Facts and on Income as Antecedent:

It is essential to note that in the early stages empirical research in the area of income distribution was mainly geared to the study of facts about size distribution and their consequences for different aspects of economic activity. The study of the consequences of the distribution pattern for different aspects of economic activity reflects the dominant tendency on the theoretical side. It is not that the classical economists did not try to account for income differentials. To argue otherwise would be to ignore Adam Smith's 'equalisation principles' - differences in money incomes many compensate for non-pecuniary advantages or disadvantages associated with earning of incomes.

The classical economists with the exception of Malthus, Sismondi, Homson and a few others implicitly approved of income inequality, finding in the 'abstinence of the rich' the mainspring of capital accumulation and therefore progress. Yet they were also aware of the fact that distribution of income had implications for poverty and degree of opportunity.

Interestingly, the tradition of treating income as antecedent rather than effect was continued in the General Theory. The Keynesian analysis, in contrast with the classical theory, removed one of the chief social justifications of great inequality of wealth by showing that it can lead to unemployment in the short run and stagnation in the long.

The old interest in the facts about income distribution, of course, continued as the growing prosperity of the nations brought into a sharp focus the social problem of inequality of income.

Of various generalisations regarding the functional relationship between size of income and number of recipients, the pareto distribution deserves particular mention for two reasons:

1. It is the first important generalisation based on systematic observations of the nature of size distribution of income, and

2. The various attempts to theorize about the nature of size distribution. He has defined inequality as

\[ N = AX^{-\alpha} \]
Where $\Pi$ is the measure of inequality and higher the value of $\Pi$ the lower is the inequality.

Statistics of income distribution collected since Pareto's time, show that the frequency curve of income is not hyperbolic throughout the whole range but is hump shaped with at least one mode.

Theories of Income Distribution

Two models which meet more fully the criteria of economic theory are those of Tinbergen\textsuperscript{36} and Reder.\textsuperscript{37} The models emphasize the rational choice of both - those who provide and those who demand various attributes required in economic activity.

The first model is concerned with the labour income distribution and the second model refers to market.

The fact that the ability to earn income is treated as a multi-dimensions variate implies that the distribution

\begin{itemize}
\end{itemize}
of abilities may itself be skewed. If it is systematic, it proves that income generation is influenced by psychological factors of the individuals. Therefore, there is no necessary contradiction between symmetrical distribution of abilities and skewed income distribution.

It is therefore, obvious that Tinbergen\textsuperscript{38} model must either explain income of labour, capital and land separately or labour would have to be interpreted in the widest sense of this word. In the former, "in the absence of mechanism to explain the proportion in which income from different sources earned by family members, the distribution of total income must remain unexplained".

"A state of income equality would require identity of the distribution of abilities required and available."

Reder's\textsuperscript{39} model does not provide any insights and yet serves an extremely useful purpose. The model which the author characterises as a cluster of imperfectly joined, ill-fitting prices, is limited in scope. It is primarily concerned with distribution of labour income and it is regarded as relevant for explaining the initial distribution of income.

Requirements of a Complete Theory of Distribution of Income:

The emphasis on the fact of ownership of property and role of inheritance is recognised in determining the wealth distribution, it is easy to understand why the theory of personal income distribution is in a 'parlous' state. A full fledged analysis of distribution of income would require not only that the analysis of distribution of labour income be supplemented by the analysis of distribution of property income, but both the distributions be combined. The size distribution of total income is as a result very sensitive to the variations in the relative sizes of labour and property income. 40

It is precisely for this reason, the Tinbergen and Reder models which are in the form of theories, lack sense of the theory of income distribution leaving out the distribution of property income.

To contrust a formal income distribution theory may prove to be a difficult task, yet the need for and possibility of modifying it are likely to be appreciated.

Friedman mentions absence of a satisfactory theory of personal distribution of income and of a theoretical bridge connecting the functional distribution of income with the personal distribution as a major gap in modern economic theory. 41

The theory of functional distribution is, of course, primarily interesting because it throws light on the forces determining the income distribution assuming that the latter can be clearly demarcated.*

The two interpretation of Cannan and Jevons is the interdependence between production and distribution. When under employment equilibrium is identified, the available distribution has to vary accordingly with the distribution. It is not that the composition of income depends on the pattern of demand in different groups of income but the output level may depend on the shares of different income levels.

'Neo-Classical Economics' is economics about order, unemployment implies 'disorder'. Keynes General Theory rejected this concept of 'an orderly and reasonable world... and world where actions are pre-reconciled by


* Randall K.R. p Cit
the great market computer, and a world where what we intend is what will happen.

Keyne's General Theory explains the possibility of equilibrium being attained at any level of output and employment. With regard to the interpretation on the essence of General Theory, Keynes himself gives an impression emphasizing the uncertainty about the future.

"Economics about order" was inherent in the neo-classical view emphasizing the scarcity aspect of the economic problem; Keynes pointed out the chances of leaving out the scarce resources unused without discarding the value theory.

The controversy between Ricardo and Malthus would suggest that the classical theory of value and distribution was independent of what Marx called the realisation problem.

Measurement of Inequality

According to A K Sen the income inequality in economic literature can be defined in two ways. The one method is the measures that try to watch the extent of inequality through methods/techniques used in statistics.

They are the range, relative mean deviation, the variance, co-efficient of variation, standard deviation, Gini co-efficient, Lorenz curves etc., and poverty index of Sen and Atkinson measure (the equal distribution of total income).

A C Pigou and Dalton stated that when income of a poor individual is transferred to a richer person, it reduces the value of one particular measure of inequality.

The co-efficient of variation and Gini co-efficient fulfil the Pigou-Dalton condition and this does not hold valid in the case of standard deviation.

The measurement of inequality through Gini co-efficient is sensitive at all levels but if we use SD and logarithms it will be very sensitive with the lower income brackets. The good measure of inequality is the one which preserves sensitivity without violating the Pigou-Dalton conditions.

The measurement of inequality through Lorenz curves shows the percentage of income earned by the lowest 10% of the income group population and it is up to top 10%. A higher Lorenz Curve implies a more equal distribution. When we compare the two distributions and Lorenz curves, one is uniformly above that of another. When there is a variation in income, the income change from first to second shows the magnitude of inequality. At the moment when two distributions of Lorenz curves intersect, one faces more fundamental limitation of the gini co-efficient.

The disadvantage of Lorenz curves is such that does not give any definite value to the magnitude of inequality. It serves as an appendix and it has to be used along with the quantitative value. The sensitivity of Gini co-efficient depends not on the size of the income levels but on the number of individuals. This is a measure and it implies the welfare through the weighted average of individual income level at different levels and according to the rank determined. But the real situation is that the actual weights would depend upon precisely how the population is distributed over income sizes.


*Martur S. Dalip, "Poverty, Inequality and Unemployment in Rural India", B.R. Publishing Corporation, Delhi, 1985.*
Gini co-efficient is a linear function of income levels. The validity of this has been questioned by many scholars. Atkinson\(^47\) was of the opinion that Gini co-efficient lacks strict concavity.

When we want to compare the gini co-efficient, values are always conclusive, because one number must be greater than, equal to or less than another.\(^48\)

The other measures adopted in economic literature are Atkinson and Sen's measure of poverty.

Atkinson Index is an improved version to Gini co-efficient and that makes an attempt to explain by giving weightage to the income earned at different income group level depending on the judgement of the policy maker. This is considered as useful only when the results are used to measure the social value.

A K Sen (1976)\(^49\) keeping in view the shortcomings of the head count, putforth an inequality measure by making some changes.

1. It is not only necessary to know the number of people who are falling below the poverty line but it is equally important that the amount by which the income of the not 20 rich people fall short.

It is therefore Sen measure of poverty is sensitive to the gaps in the incomes of the poor.

A K Sen's measure of inequality is

\[ S \] Sample size
\[ P \] Poverty line
\[ N \] No. of people below the poverty line in the sample
\[ C_i \] Consumption expenditure of \( i \) th individuals in the sample.
\[ G \] Gini Co-efficient of the consumption expenditure of individuals below the poverty line in the sample.

In order to evaluate the impact of any actual policy on \( P_s \) it is necessary to calculate the changes in the value. This would in general require knowledge of the existing distribution of income of the poor.
Irrigation is one of the major important inputs on which agriculture is depending. In India, in all the plans, massive investment has been made to develop and bring the area under irrigation. In view of the uncertain rainfall and possibility of droughts, reservoirs have been constructed to store the water and to release when the farmers need. With canal irrigation, the multiple cropping, intensive and extensive use of land is possible and higher production can be achieved. Canal irrigation will be treated as assured water supply on time adequately.

Assured water supply is a pre-condition for the farmers to apply productivity increasing inputs in scientific cultivation. It is therefore: If HB is adopted it not only increases the production per unit of land, particularly when used in appropriate combination with other inputs. It is proved that output per unit of wet land could fetch more income than per unit of dry land cultivation.

The new agricultural strategy will not yield more when it is practiced on dry prone which receives scanty rainfall. If the zone lacks assured water supply, the


investment on capital inputs becomes risky and uncertain.

Organic manures and fertilizers are also equally important input in receiving good production. These help in providing the nutrients to the soil and plant growth. As a result the productivity is boosted in a short period. When the land is put under cultivation continuously, it losses the soil fertility. It is therefore manure and fertilizer are used for increasing agricultural productivity.