The nature and magnitude of poverty differs from country to country and from time to time. Hence, for the analysis of poverty, different scholars have treated the problem differently, depending on the economic and social conditions of the area under study. It is, therefore, the object of this chapter to give a brief review of the important concepts and measures of poverty frequently used in the literature of poverty. The chapter is divided into two sections. In section I, we try to give a brief review of the concepts of poverty followed by section II which deals with the tools used in measuring the magnitude and severity of poverty.
I

Concepts of Poverty

To start with, one may first distinguish between 'primary' and 'secondary' poverty. Rowntree, in his pioneering work in the subject, defined families whose "total earnings are insufficient to obtain the minimum necessaries for the maintenance of merely physical efficiency as being in primary poverty". Relying on the work done by Atwater and Dunlop, he estimated the average nutritional needs of adults and children, translated these needs into quantities of different foods and then into the cash equivalent of these foods. To this food-cost, a minimum sum of clothing, fuel and other expenses were added, depending on the size of the family. Rent was treated as an unavoidable addition and was counted in full. A family was, therefore, regarded as being in primary poverty if its income minus rent fell short of poverty line. On the other hand, if a family whose income level can afford to purchase the necessaries for the maintenance of physical efficiency, but divert its income to other expenditures, such families will be considered as living in secondary poverty. These two concepts of poverty indicate that poverty arose not because of the shortfall in the family's income alone, but it may also arise due to influence of other factors like food habits, social customs, etc. In other words, while income is a necessary condition but it is not a sufficient condition to identify the poor from the non-poor.
Poverty is also defined in terms of 'relative' and 'absolute' concepts. In the relative concept, the poor are identified from the Non-poor by their relative position in the income scale, regardless of whether or not they have adequate income to subsist. This is normally done, according to Rowntree, by defining poverty line as the medium or some other percentiles of the overall income distribution. It seems therefore that the relative concept of poverty reflects a situation where some people have more income than others, or of economic inequality.

In the absolute concept, on the other hand, poverty is viewed with reference to a norm of subsistence needs considered appropriate to the circumstances of the country. For example, in developing countries where incomes are low, absolute poverty is reflected mainly in the inadequacy of food-intake and the consequent undernourishment on a mass scale. Whether the definition of subsistence should include other essential minimum needs such as clothing, housing, education and health etc., would depend on the degree of economic development of a
country has attained, the degree of inequality it is prepared to tolerate and above all, the socio-political attitudes reflected through popular mandate in the political process.

According to Martin Rein, poverty may be identified from three broad stand points, viz., subsistence, inequality and externality. Subsistence is concerned with the minimum provision needed to maintain health and working capacity of a person, inequality with the relative position of different income groups, and externality with the social consequences of poverty for the rest of the society rather than its effect on the poor themselves. Thus, according to Rein, poverty amongst other things causes disutility to the rest of the society. While one cannot ignore the aspect of disutility (to the community) caused by poverty, it is perhaps appropriate to note in our context that in a society where a significant proportion of people are poor at the subsistence level, importance of externality
aspect of poverty becomes secondary, its relevance at the theoretical level notwithstanding.

Townsend argues that poverty should be regarded as a general form of relative deprivation which is the effect of maldistribution of resources. He further maintains that having control over fewer resources by people -- although an important factor responsible for poverty -- does not automatically mean that they will be in poverty. They will be in poverty if the resources they are controlling do not allow them to have the type of diet, participate in activities and a living condition and amenities customary in that society. As we will see later (Chapter 9), this concept of relative deprivation has some relevance in our study.

Although conceptually poverty may be viewed from different angles, and particularly from relative and absolute angles, it may be contended that the former (relative) approach suffers from serious limitation, for it tells us little or nothing about the extent of deprivation in its physical manifestation. In the context of India where millions of men, women and children have to worry about their next meal and where poverty is manifested in the form of physical sufferings, the relative approach of poverty does not capture a collective view of deprivation. This perhaps explains why most of the studies concerning poverty in the under-deve-
developed and developing countries (particularly in India) have adopted absolute approach to poverty.\(^8\)

However, why analysing poverty as an absolute concept, it can not deny that an element of relativity influence the absolute standard. This is because "the progress of the advanced capitalist and socialist countries has aroused expectations and led to the realisation of possibilities which may be natural to go beyond the calculus of just hunger and nutrition in estimating and analysing poverty".\(^9\)

Absolute standard, thus becomes contaminated with notions of relativity as soon as the needs they encompass move beyond such indicators as protein and calorie intake.\(^10\) In fact, the "set of needs" in a society varies as its standard of living changes.\(^11\) Thus it is appropriate to conclude that "the use of absolute standards will be more prominent in nations where much of the population suffers from severe physical deprivation. In these situations the average standard of living may be so low that (even) if one reached it we would still be the victims of serious deprivations of basic needs. As the average standard of living becomes higher, we find relativity coming more into play, either implicitly as they affect the setting of the absolute standards to be used or explicitly in designating the bottom segment of the population 'poor' ......... even (if) the latter represents a rise in which selection of the cutting point is guided by an implicit absolute standard".\(^12\)
**Absolute Poverty: Some Practical Difficulties:** Although the absolute poverty line approach is widely used in the studies of poverty in the under-developed countries yet its application is beset with certain difficulties. One of the most important difficulties is associated with the definition of a 'minimum or subsistence level of living'. The minimum or subsistence level of living is generally defined in terms of expenditure or (income) that satisfies the recommended nutritional norm. The nutritional norm is always based on the assumption that it will ensure a normal health of a person. The nutritional requirement of a person is, however, a complex problem. It is a function of several variables such as age, sex, body-weight, occupation, climate, etc. It is therefore, very difficult to precisely define a unique nutritional norm. Therefore, there appears to be no consensus among the experts about the nutritional requirement.\textsuperscript{13}

Even when one agrees on the nutritional norm, the identification of the least-cost food basket which satisfies the agreed nutritional norm is also a major problem. To be more precise, we have to identify the bundle of commodities which ensures the agreed nutritional norm. There are different combinations of this bundle of commodities having same nutritional value but each combination has different cost or price. The one with the lowest cost is supposed to be chosen and identified as the 'least-cost food basket.'
Rowntree in his study on poverty, has tried to identify such a least-cost food basket, based on his rough personal judgement. In recent times, linear programming method is being increasingly used to find out the value of the least-cost food basket. However, even this method is not free from criticism. It is said that "the least-cost diet may not conform to the prevailing consumption behaviour. Most people, and especially the poor ones, are not generally aware either of their nutritional needs or of the nutritional value of various food items. Dictates of palatability may also cause deviation from a balanced diet prescribed by rigid cost minimization. As a result, even if a person is given enough money to buy the least cost bundle, he may not in-fact do so and his nutritional needs may not be fulfilled."

Though the prevailing consumption habit may be taken care while computing the least cost diet by introducing what is called the 'palatability constraints' in linear programming exercises, but these constraints could be performed only in a very elementary way, for instance, by excluding certain commodities altogether, or by fixing their consumption at a specific level, etc. Therefore, it is possible that a good deal of arbitrariness and personal predilection may get involved in the model. However, if one
assumes that the 'least-cost food basket' can be precisely found, yet one encounters another problem when he is to decide the level of income (expenditure) at which one can purchase this 'food basket' after meeting the non-food expenditures. In practice, this is being determined by multiplying the value of the least-cost food basket by the adjustment factor, which is known as the Engel co-efficient.¹⁶ But this co-efficient is only an average value of the proportion over the entire income (expenditure) range. Since the actual value of the co-efficient varies across income (expenditure) classes, it will be more appropriate to use the value of the co-efficient relevant to the poorer section of the population.¹⁷

It is due to these practical difficulties that some scholars have advocated for the use of relative poverty line approach.¹⁸ But as we have said earlier, in societies where poverty is manifested in the form of physical suffering, the absolute poverty line, although it is not very precise and beset with certain difficulties when one tries to put it in practice, "will do more justice to the real concern for poverty in a poor country than a well defined relative poverty line".¹⁹ Therefore, in the present study by us, although we have used the absolute poverty line, the least
cost food basket has not been identified due to the problems already stated. However, we have derived the (absolute) poverty line by regressing the per capita calorie intake per day per consumer unit with corresponding total monthly per capita consumption expenditure, using the log linear transformation of the calorie-expenditure function of the form 

\[ C = aE^b \]

where \( C \) is the calorie intake per day per consumer unit, \( E \) the monthly expenditure per consumer unit, \( a \) is the intercept and \( b \) is the coefficient which shows the calorie elasticity. This has been adopted because the log transformation of calorie/expenditure compresses the distribution of calorie/expenditure at higher levels and stretches the distribution at lower levels.\(^{20}\) Therefore, the expenditure estimated for a given calorie level is more relevant than the one derived by any other method.
II

Measures of poverty

Determining the poverty line is not an end in itself. In fact, the next important step is the quantification of poverty, in which case a poverty line forms the basis for this quantification. The 'quantification' of poverty is important because it forms the basis on which the anti-poverty policies/programmes are formulated, as well as the basis on which the success or otherwise of such policies/programmes are evaluated. In this quantification of poverty, the following measures are widely used:

1. Head-Count Ratio \( (H) \): Of the various tools of poverty measurement, the earliest and widely used method is the Head-Count Ratio, which is defined as

\[
H = \frac{q^*}{n}
\]

where, \( q^* \) indicates the number of population below the poverty line, and \( n \) is the total population.
The widespread use of this measure has been inspired more by its simplicity than anything else. This measure is completely insensitive to the extent of the shortfall in income (from the poverty line) as well as to the distribution of income amongst the poor. In this regard, Sen observes "The head count ratio, despite its widespread use, is peculiarly non-discriminatory. If the poverty line is chosen to be, say, Rs 300 per year, it is completely insensitive to whether a person is earning Rs 299 or Rs 100. One might, of course, take the view that if a person's income is much below Rs 300, then he would be dead, and thus the concept of poverty line might be linked with 'subsistence'. But as the justification of the head count ratio it is just nonsense. If Rs 300 is really a strict subsistence level such that any one enjoying less than this must perish, then the measure of poverty would always tend to be zero, those who constitute to live must earn Rs 300 or more. If, on the other hand, Rs 300 is not a strict subsistence level, then the people can survive earning less, but then one person's income can be more close to Rs 300 than that of another, and their position are not
identical. Starvation can be of various degrees and some causes more acute than others. 21

In other words, this head count ratio violates the two welfare axioms which are considered by Sen to be relevant in the derivation of poverty measures. These axioms are:

(i) **Monotonicity axiom**: Which states that, given other things, a reduction of income of a person below the poverty line must increase the poverty measure; and,

(ii) **Transfer axiom**: Which states that, given other things, any transfer of income from a poor person to any one who is richer must increase the poverty measure. 22, 23

Despite these shortcomings, 'H' is still widely used. Its merit lies in its simplicity. Further its implications are easy to grasp, and it does give some rough idea about the magnitude of the problem.
Criticising the head count ratio, Sen observes "it makes it worthwhile for public policy-makers seeking credit for achievement in 'garibi hatao' to concentrate on people just below the level $y^+$ . Pushing them a little higher up brings rich dividends in terms of their poverty measures, while the credit for pushing up even the poorer people is likely to be zero in this measure unless they are pushed up quite a bit". Thus Sen maintains that any measure of poverty should satisfy the following criteria:

(i) We should be concerned not merely with the number of people below the poverty line but also with the amounts by which the incomes of the poor falls short of the specified poverty level; and,

(ii) the bigger the short fall from the poverty level, the greater should be the weights per unit of that short fall in the poverty measures.

Professor Sen suggests a simple way of doing this by taking the rank values of the poor in the income ranking as the weights to be assigned on the income short falls of the different persons within the category of the poor. "If there are $m$ people with incomes below the
poverty line, then the income shortfall of the richest
a weight of 2, the second richest a weight of 2, and
so on, ending up with a weight of 'm' on the income
shortfall of the poorest poor. This yields a measure
'p' of poverty after appropriate choice of units,

etc. This has the characteristic of being sensitive
to the exact pattern of the income shortfalls of
the poor from the poverty line.26

Sen’s measure is given by

\[ p = \frac{2}{(q^n + 1)^n} \sum_{i=1}^{q^n} (x_i - y_i)(q^n + 1 - i) \ldots (1) \]

where \( y_i \) is the income/expenditure of the \( i^{th} \) unit
arranged in ascending order of magnitude; \( n \) is the
number of unit below the poverty line * z, and \( n \) the
total population.

The poverty measure \( p \) proposed above,
however, does not satisfy the 'strong' version of the
transfer axiom. This 'erroneous' assertion that \( p \) satis-
\( fied \) the strong version has been corrected by Sen
himself in his article published the following year.27
Within short period, this measure has become very popular within the academic circle. Not that many experts like Bhathy,²⁸ Seastrand and Diwan,²⁹ Alamgir,³⁰ Alluwalla³¹ among others have used this index in their studies, but it has also aroused the response of many other experts like Anand,³² Kakwani,³³ Takayama,³⁴ Thon,³⁵ and others to further investigate the validity of Sen's index. Consequently, this index has been subjected to modifications in the hand of these experts, and some of these modifications, as Sen noted, "satisfy even the strong version of transfer, but of course do not fulfill all the other axiomatic requirements used to obtain the so-called measure $p$."³⁶ Sen further observes that "given the complex nature of the concept of poverty, it seems reasonable to argue that no one measure will be able to capture the entire concept. There is nothing particularly defeatists in accepting some 'pluralism', and pointing to a class of measures rather than to a unique 'correct' measure of poverty."³⁷

Sen's index is claimed to be superior to other measures because it satisfies the above mentioned axioms and is sensitive to the sufferings of the poor farther away from the poverty line. If policy makers are
concerned not merely with the number of the poor but also with the distribution of poverty, clearly Sen's index is the most relevant.

Further, it may be noted that for a large number of the poor, Sen's index can be written as:

$$P = H(I + (1 - I)G) \quad \text{.................................(2)}$$

where,

$$I = \sum_{i=1}^{q^s} \frac{(Z - \bar{Y}_i)}{q^s Z} ,$$

$$H = \frac{q^s}{n} ; \text{ and } G \text{ is the Gini coefficient of the income distribution of the poor.}$$

$I$ can be written (on expansion and simplification) as:

$$I = \frac{q^s (Z - \bar{Y})}{q^s Z} = 1 - \frac{\bar{Y}}{Z} \quad \text{.............(3)}$$

WHERE $\bar{Y}$ is the mean income of the poor.

Hence, from (2) by substituting the value of $I$, we get

$$P = H(1 - \frac{\bar{Y}}{Z}) + (1 - 1 + \frac{\bar{Y}}{Z}) G$$

$$= H\left(1 - \frac{\bar{Y}}{Z}\right) + \left(\frac{\bar{Y}}{Z}\right) G \quad \text{..................(4)}$$

From equation (4) it is evident that $P$ depends on parameters like $H, \bar{Y}$ and $G$. 
3. Poverty gap: Another measure which is sometimes used is the poverty gap, which measures the degree of poverty by the shortfalls of all the poor's income from the poverty line. It is given by

$$I = \sum_{i=1}^{q^*} (z - y_i),$$

where $z$ is the poverty line, $y_i$ the income/expenditure of the $i$th poor, and $y_1 < y_2 < y_3 \ldots \ldots \ldots < z$. This measure satisfies the Monotonicity axiom but violates the principle of transfer. Further, it may be noted that this measure gives information on the amount needed to raise the income/expenditure of the poor to the poverty standard, but it does not tell the number of people to whom the gap applies.
Notes and References


4. For a forceful exposition of this view, see Osmani, S.R. (1982), "Economic Inequality and Group Welfare", Oxford, p. 105

5. Ibid, p. 62


13. The FAO/WHO joint expert group has recommended a minimum of 2,223 calories per capita per day for the people in Asia and the Far East. Dandekar and Rath have taken 2250 calories. Sukhatme and the Planning Commission of India have taken 2200 calories and 2400 calories per capita per day respectively.


16. This co-efficient equals to the reciprocals of the proportion of expenditure spent on food. From various studies, this proportion has been found to be approximately one-third of the expenditure spent on food.


23. This 'transfer axiom' in his article published in 1977 is treated as a 'strong' version of the axioms. The weak states that "given other things, a pure transfer of income from a person below the poverty line to any one richer must strictly increase the poverty measure unless the number below the poverty line is strictly reduced by the transfer".

25. Ibid. p. 1463.


37. Ibid.