CHAPTER 5
Calvert (1922), while reviewing the conditions of the peasantry in the Punjab during the early part of the present century, had written, "The basic fact is that single man, trying to fight the battle of life unaided by capital, intelligent direction, enterprise and scientific knowledge, can with difficulty produce enough to maintain himself and, perhaps, a wife and children. It is this impossible puzzle with which the people of this province have been struggling."

Since it was the era of traditional technology, a feudal structure of the rural economy and an alien rule, one could hold any one of these factors, or a combination thereof, responsible for that sorry state of affairs!

Now, after some four decades of independence, with the enactment of a series of land reforms, universalization of education, and a near total modernization of the Punjab agriculture, one would expect an emancipation of the agriculturists from that sordid state in the heartland of India's Green Revolution. But the works of Bardhan (1971), Rajaraman (1976), Ahluwalia (1978), Rao (1979), Bhalla and Chadha (1981), Rao (1983) and Gupta et.al., (1983), besides others', show that absolute poverty exists in the rural
Punjab. Even the official document report, "The benefits of growth process in Punjab have not always percolated to all sections of society. In particular, it has failed to lift the poorest strata above the poverty line. There is evidence to suggest that as a result of the green revolution, the disparities in income have tended to become more accentuated." Furthermore, "The maldistribution of additional wealth generated and continuously rising prices have been responsible for a mass of population still living below the poverty line. In the case of Punjab, the fruits of growth have not percolated to the lower strata of the people."

The message is clear that poverty in rural Punjab is not associated with economic stagnation inherited from the colonial era. Perhaps, it is the product of planned rural development and agrarian change implanted on the inherited agrarian structure, demographic pressures, the political processes in the state or an urban bias in development. Studies by Vyas et al. (1981), Adelman et al. (1985), and Rao (1985) project a cheerful perspective, but the present does not seem to be as bright as the future.

Many of the studies mentioned above indicate that Calvert's 'impossible puzzle' still persists for some segments of the enterprising Punjabi farming community. The study of 'absolute poverty' assumes importance because of a heterogeneous
pattern of agricultural development and consequent 'externalities'. We propose to examine how far and why Calvert's assertion is still valid for area of our study. The district of Patiala performed very well at the macro level but the current economic fate of its micro constituents need to be probed further. In the preceding chapters we had analysed economic inequality through cumulative percentages and statistics reflecting relative-poverty. But those statistics were not designed to portray the deficiency in potential consumption and hence, as such, never brought to the surface the extent of destitution hidden in the observed income distribution.

Accordingly, this chapter is devoted to the study of 'absolute-poverty' in the sampled population of the district. While numerous studies at different levels of sophistication, have been conducted to measure poverty at the state level, hardly any work worth the name has been undertaken to gauge this phenomenon at the district level. So the findings of our study for Patiala district would be all the more relevant in the light of renewed emphasis on Integrated Rural Development Programme (IRDP) as panacea for the rural poor.

Section 5.1 will focus attention on the relevant indices available in the literature to measure absolute-poverty. The concept and choice of a suitable 'poverty-line' would also figure in the same section.
Having selected a set of poverty indices and the poverty-line, empirical estimates of poverty would be obtained in Section 5.2.

To gain some insight into the correlates of poverty, a comparison between the 'poor' and the 'non-poor' households will be made in the last Section 5.3.

5.1 Absolute Poverty—Concept and Measurement

On the face of it, measurement of poverty involves just two neat steps viz., identification and aggregation. But the serious students of this complex phenomenon (poverty) are aware of the numerous difficulties underlying these procedures. For, the term poverty itself has several connotations like want, deprivation, destitution and wretchedness etc. And each, in turn, asks for a distinct qualifying clause.

Further, over these years, this simple looking term has come in for so many passionate descriptions, axiological prescriptions and impersonal mechanistic subscriptions that a mystical dimension seems to have engulfed the naked truth.

To simplify matters, invariably, one or the other prefix is employed to highlight specific versions of this concept. But the postulational and the operational contents of a particular prefix are always open to multiple interpretations. This equally applies to the chosen prefix 'absolute' in the concept of our interest, namely absolute poverty.
Absolute poverty reflects a level below which people would find it difficult to survive. Obviously, biological survival calls for some minimum necessities in terms of dietary standards and provision of some other items to avoid fatal exposures to nature with accompanying health care for an efficient functioning of the 'man-machine'. But generally, it is the nutritional component that is mainly stressed.

As Sen (1981, p.17) puts it, "Indeed, there is an irreducible core of absolute deprivation in our idea of poverty, which translates reports of starvation, malnutrition and visible hardship into a diagnosis of poverty without having to ascertain first the relative picture."

This approach amounts to our undue reliance on nutrition standards based on research in the animal house or in the laboratory and a disregard for the fact that people exist—even as biological entities in a community/society. So fixation of the norms has to be done with reference to the society in which human beings live, thus calling out attention to the relative dimension of the 'absolutist' approach.\(^{10}\)

Even if we by-pass these minimum cultural needs and focus our attention primarily on the dietary norm for the identification of the poor, we are faced with two fundamental issues:
i) the composition of an acceptable consumption menu; and

ii) the translation of that accepted dietary norm into an expenditure/income figure.

Both these issues have involved the top names in the country, in the fields of nutrition, statistics, economics and planning, in a rather prolonged debate. And, as yet, the choices regarding calorie requirement, protein, amino-acids and vitamins requirements, do not appear to be narrowing down to a unique point. However, some consolation is available in the observations "that most of the malnourished suffer mainly from calorie rather than protein deficiency.... People who do not suffer from calorie deficiency also do not suffer from protein deficiency. On the other hand, people who suffer from protein deficiency suffer simultaneously from calorie deficiency, that is to say they simply do not have enough to eat" (Chaudhuri, 1982, pp.185-187). But this apparent consensus on a calorie norm sets rolling other related issues viz., the choice between a minimal actual calorie intake, minimal calorie requirement, average calorie requirement and the quality content of the diet that would supply the requisite calories.

At this point, attention needs to be drawn to the exchanges between Rao (1977); Sukhatme (1977, 1978, 1981); Dandekar (1981a, 1981b), and Lipton's (1981) persuasive case
for 80 per cent of the average calorie norm. That explains the use of Constant Calorie Model, Variable Calorie Model, Fixed Expenditure Approach and the like, in working out the incidence of poverty in Indian Union and the States.\textsuperscript{12}

It, therefore, seems inevitable that working with any poverty line—as a cut-out point for identifying the poor—is open to criticism; vindicating Rein's (1971) assertion that "almost every procedure in the subsistence level definition of poverty can be reasonably challenged."\textsuperscript{13} But this is no excuse for seeking refuge in nihilism. After all, positive move in this direction requires a clear statement about an explicit poverty norm acceptable in some professional circles.

Accordingly, in the present study, we have adopted two poverty norms, $N_0$ and $N_m$, as the minimal levels of yearly income (per capita terms) that provide necessary purchasing power for the procurement of a 'balanced-diet' fulfilling the accepted calorie norm. The line $N_0 = Rs.698$ (at 1979-80 prices) is based on the works of Bardhan (1974) and Ahluwalia (1978). Our poverty line $N_m = Rs.767.80$ (at 1979-80 prices) is based on essentially the same procedure as adopted for obtaining $N_0$ but, in addition, this cut-off point takes care of Rao's (1977) caution that "poverty has to be identified with deficiency in the total level of living. And total level of living includes not only energy require-
Having exercised our choice about the poverty-norm, we can now attend to the other aspect of our job i.e., selection of poverty indices for aggregating the poor.

5.1(b) Indices for the Measurement of Poverty

It is often made out that "Poverty need not always be measured; it needs to be prevented and abolished." However, it may be pointed out that the removal of poverty lies in a domain over which statisticians have little control. They can contribute their bit in overpowering this demon by making its measurement possible and meaningful in a manner that brings all the latent dimensions of poverty to the fore.

Availability of a wide range of poverty indices shows their sensitivity to the subject and sums up the collective response of their profession to this complexity. Starting with a simplistic measure like the 'Head-count Ratio', which treated the poor as a homogeneous lot, we now have indicators that deal with poverty in terms of the deprivation gaps suffered by the poor (e.g., 'Poverty-gap Ratios'). There are poverty indices, like Sen's $P$ and related measures, which take due care of the absolute as well as the relative nature of these gaps. Further refinements have brought in the
capacity to treat each individual poor differently, with 
or without reference to the non-poor category or its 
distribution profile (see, for instance, Beckerman's 'Relative 
Burden of Poverty' measure, Takayama's 'Censored Gini' index 
and Clark, Hemming and Ulph's esoteric 'Poverty Ratio').

The choice between these measures is indeed a 
difficult one because every measure has tried to capture a 
different facet of poverty. Going through the works of 
Amend (1977); Atkinson (1969, 1970, 1980); Beckerman (1979); 
Chakravarty (1981); Orshansky (1969); Sen (1973, 1976, 1979, 
1981, 1983); Townsend (1954, 1965, 1971, 1974); and 
Takayama (1979), we picked up the following indices of 
poverty for further empirical investigations:

i) The Head-Count Ratio ($H$);
ii) Poverty-Gap Ratio ($I_1$);
iii) Poverty-Gap Ratio ($I_2$);
iv) Sen's Poverty Measure ($P$);
v) Beckerman's Relative Burden of Poverty 
Measure ($B$);
vi) Sudhir Amans's Poverty Measure ($A$); and 
vii) Takayama's Censored Gini Index as a Measure of 
Povrty ($T$).

Calculation procedure and properties of each of 
these measures are described below.
With our accepted poverty-norm \( N \), let us assume that out of \( n \) units in the population, \( p \) units (\( p < n \)), are poor i.e., \( Y_i \leq N \) for \( i = 1, 2, \ldots, p \); where \( Y_i \) is the income of the \( i \)th unit. We, then, have the following income profile, arranged in the ascending order:

\[
Y_1 < Y_2 < \ldots < Y_p < N < Y_{p+1} < Y_{p+2} < \ldots < Y_n
\]

for the society as a whole.

Given net household incomes \( Y_i \); \( (i=1,2,\ldots,252) \), define,

\[
y_i = \frac{Y_i}{w_i} \quad \text{and} \quad y'_i = \frac{Y_i}{w'_i}
\]

... (5.1.1)

where \( w_i \) is the size of the \( i \)th household in biological units

and \( w'_i \) is the size of the \( i \)th household in consumer-equivalent units.

For a particular \( y \), all observations are ranked in ascending order of magnitude. Then \( p \) is the number of units with \( Y_i \leq N \).

Define,

\[
p^* = \sum_{i=1}^{p} w_i \quad \text{and} \quad n^* = \sum_{i=1}^{n} w_i
\]

... (5.1.2)

New mean income \( \mu \) for the population as a whole is,

\[
\mu = \frac{\sum_{i=1}^{n^*} y_i w_i}{\sum_{i=1}^{n^*} w_i}
\]

... (5.1.3)
Income gap (or poverty gap) of the ith unit is

\[ g_i = (N - y_i) \]  \hspace{1cm} \ldots (5.1.4)

and aggregate poverty gap for the poor is

\[ g = \frac{1}{i} \sum_{i=1}^{p} (N - y_i) w_i \]  \hspace{1cm} \ldots (5.1.5)

The Head-count ratio (H) is then given by

\[ H = \frac{P^*}{N^*} \]  \hspace{1cm} \ldots (5.1.6)

and the average poverty gap by

\[ g^* = \frac{g}{p^*} \]  \hspace{1cm} \ldots (5.1.7)

Income-gap ratio or poverty-gap ratio can, then be defined in two alternative ways:

\[ I_1 = \frac{g}{pN} = \frac{g^*}{N} \]  \hspace{1cm} \ldots (5.1.8)

and

\[ I_2 = \frac{g^*}{N} \]  \hspace{1cm} \ldots (5.1.9)

In the above formulations (equations 5.1.6, 5.1.8 and 5.1.9), poverty gaps were either ignored (as in the Head-count ratio) or assigned equal weights. Both the procedures are faulty because the intensity and extent of deprivation ought to figure in the poverty index. Sen's poverty index (P) captures much that is of interest in exercises on the measurement of poverty i.e., absolute as well as relative deprivation. The measure is given by
CUMULATIVE % OF POPULATION

\[ \text{Sen's } P = \frac{\triangle OKF}{\triangle OQQD} \]

Fig. 5.1 DIAGRAMATIC PRESENTATION OF SEN'S POVERTY MEASURE
where $G$ is the Gini coefficient of the income of the poor, i.e.,

$$G = \frac{\sum_{i=1}^{P} \sum_{j=1}^{P} w_i |y_i - y_j| w_j}{2 \sum_{i=1}^{P} y_i w_i \sum_{i=1}^{P} w_i} \quad \ldots (5.1.11)$$

We notice that Sen's formulation takes account of the number of poor, their levels of absolute deprivation (in terms of the income shortfalls) and finally, by adopting the axiom of a ranked relative deprivation (i.e., the weight on the income gap $g_i$ of the $i$th individual being given by the income rank of the $i$th individual among the poor), the levels of relative deprivation as well.

Besides diagramatic presentation (see Fig.5.1), the measure $P$ can be expressed in different functional forms like the one proposed by Blackorby and Donaldson (1978):

$$P = \frac{H(N - E^6)}{N} \quad \ldots (5.1.12)$$

where $E^6$ is the 'equally distributed equivalent income' of the poor, when the evaluation has been done with the Gini social evaluation function.

Obviously, a change in the social evaluation function would produce a different 'equally distributed equivalent income' and hence a new poverty measure, exactly on the same lines. In fact, the two basic axioms of monotonicity and
transfer-sensitivity have been often varied to obtain other poverty indices and family of poverty measures. Two such variants, due to Anand (1977) and Takayama (1977), have been extensively applied in the field because of their intuitive appeal and neat interpretation. A brief description of these measures follows.

With Anand (1977) we can rewrite the Sen index $P$ as

$$ P = \frac{p^*}{n^*} \cdot \frac{1}{n} \left[ N - \mu_p(1 - G) \right] \quad \ldots (5.1.13) $$

where $\mu_p$ is mean income of the poor and $G$, the Gini coefficient of the distribution of income among the poor.

Thus,

$$ \frac{2}{(p^* + 1)n^*N} \quad \ldots (5.1.14) $$

is the implicit normalization parameter in Sen's measure.

Anand, arguing for relating poverty gaps with the total income of society, suggests

$$ 2 \left[ (p^* + 1)n^* N \right]^{-1} \quad \ldots (5.1.15) $$

as the normalization parameter. Substitution of this parameter in Sen's formulation results in Anand's poverty measure

$$ A = \frac{p^*}{n^*} \cdot \frac{1}{\mu} \left[ N - \mu_p(1 - G) \right] \quad \ldots (5.1.16) $$

or

$$ A = P \cdot \frac{N}{\mu} \quad \ldots (5.1.17) $$

i.e., $A$ differs from $P$ only by a multiplicative constant.
This difference simply reflects normalization per unit of national mean income rather than the poverty line income. So, if one is interested in checking the nations' potential ability to meet the challenge of poverty, Anand's formulation would be better suited for the purpose. Because the value of $A$ itself gives the poverty gap as a percentage of total personal income and hence determines the size of efforts needed to bridge the poverty gaps.

However, instead of expressing the income required to close the poverty gap as a fraction of total income, one can define an index $F$ which expresses the gap as a ratio of the total income of the non-poor. Such a ratio would reflect the burden of poverty on the non-poor group, in case a direct transfer of income from this group is required for elimination of poverty.

Beckerman (1977), in a similar fashion, used a simpler version of the relative burden of poverty index:

$$B = H I_2 = \frac{p^e}{n^e} \cdot \frac{p^s}{p^e} \cdot \frac{1}{\mu} = \frac{e^s}{n^e \mu} \quad \ldots \quad (5.1.18)$$

This measure involves the per capita gap as a percentage of the mean income of the community and also the proportion of the poor in it, without any concern for the distribution of income amongst the poor. In spite of this weakness, the index has been put to several uses.

Besides the above discussed indices of poverty,
another interesting variant of the Gini coefficient is gaining currency. Takayama (1977) proposed a very simple translation of the Gini measure of inequality which could be used as a poverty measure. The main idea is to obtain a 'censored' income distribution from the actual distribution by replacing all incomes above poverty line by incomes exactly equal to the poverty line i.e., \( y_i^* = N \) for all \( i > p \). The Gini coefficient of this censored income distribution gives Takayama's index of poverty:

\[
T = \frac{\sum_{i=1}^{n} \sum_{j=1}^{n} w_i |y_i^* - y_j^*| w_j}{2 \sum_{i=1}^{n} y_i^* w_i \sum_{i=1}^{n} w_i} \tag{5.1.19}
\]

where

\[
y_i^* = y_i, \quad \text{if } y_i \leq N
\]

\[= N, \quad \text{otherwise.}\]

Other variants of this index have also been suggested by applying other indices of inequality to the censored income distribution. As mentioned earlier, each of these measures has something unique about it—the aspect of poverty captured by the index. Therefore the choice of poverty index would depend on the purpose for which the measurement is being sought. But, since, the array of interests in poverty extends from simple numerical description to judging country's potential ability to meet the challenge of poverty and determination of the requisite resource transfer. All the
indices assume relevance on one or the other count.

The fact that poverty measures are, mathematically, open to descriptive and ethical interpretations, their relative superiority cannot be determined uniquely. However, certain axioms have been proposed as tests of legitimacy of poverty measures. A brief discussion of these axioms follows.

5.1(c) Axioms of Legitimacy of Poverty Measures

Starting with Sen’s (1976) bid to adopt an ordinal approach to measure poverty, the axiomatization wave swept across the profession. His approach, being a welfare theoretic one, involved many researchers in the quest of valid norms for poverty measurement. Every fresh attempt to develop improved indices of poverty, for increasing their transfer sensitivity, brought in additional axioms. But, by and large, Sen’s original motivational axioms of ‘monotonicity’ and ‘transfer’ did make the starting point for newer refined measures. Therefore, following Sen (1981), we shall discuss these two axioms as well as his ‘focus’ axiom as tests of legitimacy of poverty measures.

Let \( C \) be the set of individuals in a community comprising \( n \) people, with \( y_i \) as the income of \( i \)th person i.e., \( C = \{i|1,2,\ldots, n\} \), ... (5.1.20) and the income vector, \( Y = [y_1, y_2, \ldots, y_n] \) ... (5.1.21)
Now consider two states of this society, say, zero-and one with the income vectors \( Y_0 \) and \( Y_1 \), respectively, so that

\[
Y_0 = \begin{bmatrix} y_{01}, y_{02}, \ldots, y_{0n} \end{bmatrix}, \quad \ldots (5.1.22)
\]

\[
Y_1 = \begin{bmatrix} y_{11}, y_{12}, \ldots, y_{1n} \end{bmatrix}
\]

Given our poverty norm \( N \), we can define the poor as subsets of \( C \) for the two states as follows:

\[
P_0 = \{ i \mid y_{0i} \leq N; \ i \in C \}, \quad \ldots (5.1.23)
\]

\[
P_1 = \{ i \mid y_{1i} \leq N; \ i \in C \}
\]

Let the poverty measures be such that \( Y_0 \) and \( Y_1 \) give values \( M_0 \) and \( M_1 \), respectively, for given \( N \) and \( C \). Then **Monotonicity Axiom** says that, given other things, a reduction in income of any individual below the poverty line must increase the poverty measure, i.e., if for some \( j \in P_0 \cap P_1 : y_{0j} > y_{1j} \), and for all \( i \in C \) such that \( i \neq j \) : \( y_{0i} = y_{1i} \), then \( M_1 > M_0 \) ... (5.1.24)

And the **Weak Transfer Axiom** requires that a pure transfer of income to a poor individual, i.e., from among those below the poverty line, from a richer person, without making either cross the poverty line, must reduce the poverty measure, i.e., if for some \( j \),

\[
j \in [ \{ P_0 \cap P_1 \} \cup \{ (C-P_0) \cap (C-P_1) \} ] \quad \text{and}
\]
\[ k \in P_0 \cap P_1 : [(y_{0j} > y_{1j}, y_{1k} > y_{0k}) \text{ and } (y_{0j} - y_{1j}) = (y_{1k} - y_{0k})] \quad \text{...}(5.1.25) \]

and for all \( i \in C \) such that \( i \neq j, k : y_{0i} = y_{1i} \)
then \( M_1 < M_0 \).

The two axioms of monotonicity and transfer have an obvious intuitive appeal and are well accepted in the profession. But the Focus Axiom that makes poverty measurement as a characteristic of the poor alone, i.e., if \( y_{0i} = y_{1i} \) for all \( i \in P_0 \cup P_1 \), then \( M_0 = M_1 \), has often been ignored. The main argument being that poverty is a characteristic of a nation and hence poverty indices should reflect the relative burden of poverty. Furthermore, a measure is expected to indicate the proportion of the income of the non-poor that needs to be transferred to wipe out the poverty gaps of the poor.\(^{25}\)

On checking the list of our selected indices of poverty against the Monotonicity, the Weak Transfer and the Focus Axioms, the following picture emerges (see Table 5.1).

This shows that Sen's poverty measure (\( P \)) is the only legitimate index à la Sen! However, Sen (1979) himself commends the indices proposed by Anand (1977), Beckerman (1977), Takayama (1977) and Poverty-gap ratio (\( I_2 \)) for highlighting other specific aspects of poverty. And the outcast, Head-count ratio, deserved to be included in the
### Table 5.1

**Legitimacy of Poverty Measures: A Summary**

<table>
<thead>
<tr>
<th>Poverty Index</th>
<th>Axiom</th>
<th>Monotonicity</th>
<th>Weak Transfer</th>
<th>Focus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head-Count Ratio</td>
<td>x</td>
<td>x</td>
<td>(At times perverse)</td>
<td>✓</td>
</tr>
<tr>
<td>Poverty-gap Ratio-I</td>
<td>✓</td>
<td>x</td>
<td>(for $j$ with $y_j &lt; \bar{y}$)</td>
<td>✓</td>
</tr>
<tr>
<td>Poverty-gap Ratio-II</td>
<td>✓</td>
<td>(same as for $I_i$)</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Sen's Poverty Index</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Anand's Measure</td>
<td>✓</td>
<td>✓</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Beckerman's Index</td>
<td>✓</td>
<td>(same as for $I_i$)</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Takayama's Gini censored</td>
<td>x</td>
<td>✓</td>
<td>(At times perverse)</td>
<td>✓</td>
</tr>
</tbody>
</table>
list by virtue of its historicity and popularity amongst researchers on poverty in India and abroad.\textsuperscript{26}

Thus, in spite of the fact that the Sen Index captures much that is of interest in attempting to measure poverty, it needs to be supplemented by other indices in formulating programmes for poverty alleviation. Consequently, in the present study, we shall employ all these poverty measures for estimating poverty in all its aspects.

5.2 Dimensions of Absolute-Poverty in Rural Patiala—Empirical Estimates

In the absence of any authentic study on poverty in rural areas of Patiala district, a careful treatment of the subject is not only desirable but also essential. Therefore, we prefer working with all the chosen indices of poverty for a better understanding of the problem. Afterall, treating poverty as 'uniform mass of poor, flattened out along a subsistence level is (only) a statistical abstraction'\textsuperscript{27} and we better bring it a little closer to reality.

Table 5.2 and 5.3 sum up our findings for two cut-off points $N_c$ and $N_m$—the poverty-lines—treated on per capita and per consumer unit basis.\textsuperscript{28} The results reveal that, in terms of our conservative poverty norm ($N_c$), 25 to 26 per cent of the cultivating households do not have sufficient purchasing power to lead a reasonable life.
### Table 5.2
Profile of Rural Poverty: Patiala District
(1978-80)

<table>
<thead>
<tr>
<th>Poverty Line</th>
<th>Poverty Line(N_c) Unweighted Index</th>
<th>Poverty Line(N_m) Unweighted Weighted Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head-Count Ratio : H</td>
<td>0.2642 0.2476</td>
<td>0.2850 0.2628</td>
</tr>
<tr>
<td>Poverty-Gap Ratio : I_1</td>
<td>0.4912 0.5035</td>
<td>0.5023 0.5199</td>
</tr>
<tr>
<td>Poverty-Gap Ratio : I_2</td>
<td>0.5645 0.5752</td>
<td>0.5862 0.6022</td>
</tr>
<tr>
<td>Sen's Poverty Measure : P</td>
<td>0.1782 0.1499</td>
<td>0.1933 0.1623</td>
</tr>
<tr>
<td>Beckerman's Relative Burden of Poverty Measure : B</td>
<td>0.1492 0.1424</td>
<td>0.1671 0.1583</td>
</tr>
<tr>
<td>Anand's Poverty Measure : A</td>
<td>0.2048 0.1713</td>
<td>0.2256 0.1880</td>
</tr>
<tr>
<td>Takayama's Censored Gini : T</td>
<td>0.1245 0.0677</td>
<td>0.1361 0.0738</td>
</tr>
</tbody>
</table>

Source: Computed

Poverty Norms:

- \( N_c \) = Rs. 698 per annum per person
- \( N_m \) = Rs. 767.80 per annum per person.
The average income gap for these households stood between 49 and 57 per cent but the relative burden of poverty is just 15 per cent. The poverty gap as a fraction of the total income needed to support everyone in the population at the poverty level comes to over 15 per cent (18 per cent in the un-weighted case), while this gap stands at 17 to 20 per cent of total income of the cultivating households.

On using the modified poverty norm \( N_m \) all the poverty indices, understandably, register an upward trend thus reporting a higher incidence of poverty. However, in both the cases poverty-line was accepted in per capita terms, contrary to the spirit of subsistence levels embodied in the definition of absolute poverty. As discussed by Atkinson (1969), Fields (1980), Gaiha et Kasmi (1981) and Sen (1981), one should convert each family into equivalent adults by the use of some equivalence scale. Following this procedure, the exercise of poverty measurement was repeated by using the poverty norms \( N_0 \) and \( N_m \) that take care of the said lacuna.

Revised results are presented in Table 5.3. We notice that, but for the poverty-gap ratios \( I_1 \) and \( I_2 \), all the measures of poverty show a lower incidence of poverty than that observed by using the poverty norms \( N_0 \) and \( N_m \), respectively. What is striking is the revelation that even
### Table 5.3
Profile of Rural Poverty: Patiala District (1972-80)

<table>
<thead>
<tr>
<th>Poverty Line</th>
<th>Poverty Line ( N_o )</th>
<th>Poverty Line ( N_w )</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unweighted Index</td>
<td>Weighted Index</td>
</tr>
<tr>
<td>Head-Count Ratio : ( R )</td>
<td>0.1917</td>
<td>0.1787</td>
</tr>
<tr>
<td>Poverty-Gap Ratio : ( I_1 )</td>
<td>0.5279</td>
<td>0.5304</td>
</tr>
<tr>
<td>Poverty-Gap Ratio : ( I_2 )</td>
<td>0.5873</td>
<td>0.5860</td>
</tr>
<tr>
<td>Sen's Poverty Measure : ( P )</td>
<td>0.1378</td>
<td>0.1143</td>
</tr>
<tr>
<td>Beekman's Relative Burden of Poverty Measure : ( B )</td>
<td>0.1126</td>
<td>0.1047</td>
</tr>
<tr>
<td>Amad's Poverty Measure : ( A )</td>
<td>0.1533</td>
<td>0.1263</td>
</tr>
<tr>
<td>Takayama's Censored Gini : ( T )</td>
<td>0.0988</td>
<td>0.0542</td>
</tr>
</tbody>
</table>

Source: Computed

Poverty Norms:
\[ N'_0 = \text{Rs.} 698 \text{ per annum per consumer unit.} \]
\[ N'_w = \text{Rs.} 767.80 \text{ per annum per consumer unit.} \]
the higher poverty norm $N'_a$ results in lower levels of poverty, in all its aspects, as compared to those estimated with a lower poverty norm $N'_o$. The use of $N'_o$ as the poverty line—an adapted and updated version of Dandekar & Rath (1971), Bardhan (1971) and Ahluwalia (1978)—makes the task of poverty removal look all the more easy so far as the state of Punjab is concerned. A more easy task, however, need not mean a less important task and this is specially true in the present case where poverty is sought to be removed from a troubled state, which otherwise claims to be the richest state in the country.  

In addition, poverty alleviation, from amongst the peasantry, might call for a continuing effort rather than a once for all help.

The measurement of poverty, as discussed earlier involved identification of the poor as the first step. Therein, the procedure required our choosing an appropriate poverty-line as the cut-off point obtaining the dichotomy 'poor' and the 'non-poor'. While that exercise helped us determine the extent of absolute poverty, it provided no clues to the query, 'Who are the poor'. This aspect of identification would take us to the causes of poverty. For, if policy-makers are to be helped in matching targets with instruments, then the economic, social, demographic, institutional and even infrastructural factors that go with the poor, have to be pin-pointed.
The so-called rural-poor do not make a homogeneous lot. They differ from one another with respect to the amount of land, man-power and other productive assets they own. Their castes, types of employment, family compositions and economic activity mix are highly diverse. Therefore, it is important to find out their commonalty as a group and so also their diversity from the non-poor group. The subsequent discussion centres around these aspects of the cultivating households.

5.3 The 'Poor' and the 'Non-Poor' Households—A Statistical Comparison of Some Attributes

While thinking about the poor, one may remember Tolstoy's dictum that "happy families are all alike, but every unhappy family is unhappy in its own way." Because, in terms of biological survival, besides the two extremes of living and dead, there are many who continue to slide down right up to the point of death due to starvation or starvation related diseases. At the same time there are those who just somehow manage to satisfy their physiological needs and, at time, are able to regain the last ground either by lowering their basal metabolic rate er by increasing the efficiency of utilization of the calories in performing work. Thus, in such a wide range of destitution, hunger is the sole common factor.

However, a causal chain links up nutritional levels
and economic factors like, factor endowment, opportunity of gainful employment and the degree of capacity utilization itself. As Mathews (1981, p.5) put it, "one could identify the rural poor with reference to the degree of possession and utilization of the two assets of land and labour-power."


Focusing our attention exclusively on poverty, we find that, in spite of the scholarly efforts which have gone into the measurement of rural poverty and its genesis, there
is no consensus about the ordering of the causes of poverty. It is therefore, essential to draw a line between the observed commonalty of the poor and a possible variety of causality underlying mechanisms of generation of poverty. With this awareness we selected some twenty characteristics of the cultivating households for drawing a comparison between the poor and the non-poor households on the basis of a simple 'Test of Proportions' exercise.\[33\]

The list of chosen characteristics is both varied and extensive, without any claims about it being exhaustive. But all the popular correlates of poverty like caste, illiteracy, paucity of productive assets, degree of participation in land and labour markets, indebtedness, irrationality of the input-use on individual crops and faulty cropping pattern, have been included. Though the nomenclature, adopted here, is self descriptive in most cases, entities like the 'crop system index' and the 'crop yield index'—the determinants of production rationality—need elaboration.

Let

- \(S_i\) = Average standard net income per acre from the \(i\)th crop in the locality; \((i=1, 2, \ldots, n)\)
- \(Y_i^1\) = Average yield (at per acre) of the \(i\)th crop in the locality;
- \(P_i^1\) = Percentage of the total crop area devoted to the \(i\)th crop in the locality;
\( Y_i^f \) = Yield of the \( i \)th crop on the farm;
\( P_i^f \) = Percentage of the total crop area devoted to the \( i \)th crop on the farm;

And denote
\[ w_i = \frac{S_i}{\sum_i S_i} \] to be the weightage of the \( i \)th crop;
\[ F_i^f = \frac{P_i^f}{\sum_i P_i^f} \times 100 \] as the relative area index of the farm, and
\[ Y_i^f = \frac{Y_i^f}{Y_i^1} \times 100 \] as the relative yield index on the farm. Then, for a farm,

\[
\text{Crop System Index} = \sum_{i=1}^{n} w_i F_i^f \quad \text{... (5.3.1)}
\]
\[
\text{Crop Yield Index} = \sum_{i=1}^{n} P_i^f Y_i^f \quad \text{... (5.3.2)}
\]

These two indices can be adjusted for relative cropping intensity (defined as the ratio of cropping intensity on the farm to that of the cropping intensity in the area) on the farm to account for the cropping intensity differences.

The crop yield index reflects the overall productivity level of the farm relative to the productivity level obtained in the area. The average farm in the locality is represented by a value 100 for the index. Obviously, a score of over
100 for a unit implies it being more efficient than the average farm, and a value below 100 deems the farm to be relatively inefficient.

Thus the measure is a good proxy for the rationality of input-use on individual crops on the farm; rationality being defined in terms of 'how to produce' and 'how much to produce'. However, this index remains silent about the third question of resource allocation, viz., 'what to produce'. The system index is basically designed to meet this point. It reflects the rationality of the cropping pattern itself, thereby measuring the efficiency in combining various activities on the farm.

A system index of more than 100 shows relative efficiency and that of below 100, relative inefficiency in combining enterprises on the farm. These indices were compiled individually for all the 252 farming units of the district and their relative efficiency on both the scores was determined.

Subsequently, the remaining quantitative characters were also transformed into qualitative dichotomies. This (as already pointed out) yielded a set of twenty attributes that formed the basis of our 'Test of Proportions' exercise. The results are shown in Table 5.4. On the basis of these results we can say that there are no significant differences between the proportions of the poor and the non-poor
Table 5*4
Comparison of the Poor and the Non-Poor Cultivating Households: Results of the Test-of-Proportions Exercise

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Proportion of the Poor</th>
<th>Proportion of the Non-Poor</th>
<th>Difference</th>
<th>( \frac{p_1 - p_2}{\sqrt{\frac{p_1(1-p_1)}{n_1} + \frac{p_2(1-p_2)}{n_2}}} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scheduled Caste Membership</td>
<td>18.18</td>
<td>11.17</td>
<td>7.01</td>
<td>1.39</td>
</tr>
<tr>
<td>Literate Head of the Household</td>
<td>18.18</td>
<td>36.55</td>
<td>18.37</td>
<td>3.55*</td>
</tr>
<tr>
<td>Holding Category:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Marginal</td>
<td>21.82</td>
<td>8.12</td>
<td>13.70</td>
<td>2.86*</td>
</tr>
<tr>
<td>b) Small</td>
<td>56.36</td>
<td>41.12</td>
<td>15.24</td>
<td>2.02*</td>
</tr>
<tr>
<td>c) Medium</td>
<td>14.35</td>
<td>24.37</td>
<td>9.82</td>
<td>1.56**</td>
</tr>
<tr>
<td>d) Large</td>
<td>7.27</td>
<td>26.40</td>
<td>19.13</td>
<td>3.03*</td>
</tr>
<tr>
<td>Indebtedness</td>
<td>34.55</td>
<td>37.06</td>
<td>2.51</td>
<td>0.34</td>
</tr>
<tr>
<td>Ownership of Bullocks</td>
<td>78.18</td>
<td>74.62</td>
<td>3.56</td>
<td>0.55</td>
</tr>
<tr>
<td>Ownership of Tractors</td>
<td>3.54</td>
<td>29.44</td>
<td>25.80</td>
<td>3.99*</td>
</tr>
<tr>
<td>Ownership of Irrigation Source</td>
<td>87.27</td>
<td>94.42</td>
<td>7.15</td>
<td>1.83**</td>
</tr>
<tr>
<td>Ownership of Carriage</td>
<td>45.45</td>
<td>58.38</td>
<td>12.93</td>
<td>1.72**</td>
</tr>
<tr>
<td>Ownership of Thresher</td>
<td>36.36</td>
<td>49.75</td>
<td>13.39</td>
<td>1.77**</td>
</tr>
<tr>
<td>Engaging 'Siri'</td>
<td>14.55</td>
<td>12.18</td>
<td>2.37</td>
<td>0.47</td>
</tr>
<tr>
<td>Hiring Pat. Labour</td>
<td>12.73</td>
<td>35.53</td>
<td>22.80</td>
<td>3.27*</td>
</tr>
<tr>
<td>Renting-in-land</td>
<td>34.55</td>
<td>45.18</td>
<td>10.63</td>
<td>1.42</td>
</tr>
<tr>
<td>Renting-out land</td>
<td>14.55</td>
<td>7.11</td>
<td>7.44</td>
<td>1.74**</td>
</tr>
<tr>
<td>Purchasing Land</td>
<td>14.55</td>
<td>27.41</td>
<td>12.86</td>
<td>1.97*</td>
</tr>
<tr>
<td>Selling Land</td>
<td>30.91</td>
<td>11.68</td>
<td>19.23</td>
<td>3.47*</td>
</tr>
<tr>
<td>Participation in other (urban) Labour Market</td>
<td>7.27</td>
<td>18.27</td>
<td>11.00</td>
<td>1.99*</td>
</tr>
<tr>
<td>Having Off-farm Employment</td>
<td>27.27</td>
<td>27.92</td>
<td>0.65</td>
<td>0.10</td>
</tr>
<tr>
<td>Efficiency: (Crop System Index)</td>
<td>34.55</td>
<td>35.53</td>
<td>0.98</td>
<td>0.14</td>
</tr>
<tr>
<td>Efficiency: (Crop Yield Index)</td>
<td>14.55</td>
<td>40.61</td>
<td>26.06</td>
<td>3.60*</td>
</tr>
</tbody>
</table>

Source: Computed.

* Significant at 5% Two-Tailed Test
** Significant at 10% Two-Tailed Test
* Significant at 5% Single-Tailed Test
** Significant at 10% Single-Tailed Test
households, so far as the scheduled caste membership, indebtedness, ownership of bullocks, engagement of 'Siri', renting-in of land, off-farm employment and efficient crop system are concerned.

Poverty, thus, is not directly linked with low caste, indebtedness and sale of labour. However, it is the concentration of scheduled castes at the lowest bracket of land distribution, deficient consumption budgets of the lowly placed and paucity of productive assets in general, which establish the causal link creating an impression that low caste, poverty and indebtedness always go together. But such simplistic statements about caste and poverty should be avoided and more stress be laid on economic and meta-economic forces for studying the causes of poverty.

We also notice that the urge for augmenting the productive base of the unit through renting-in of land and engagement of 'Siris' has a striking similarity across the two groups. And, significantly enough, the proportion of relatively efficient combining enterprises are no different from the poor and the non-poor i.e., they adopt almost similar cropping patterns.

On the other hand, significant differences are observed in the possession of land, tractors, irrigation source (wells and tube-wells), threshers and ownership of
carriage, between the two groups. Although the proportion of the poor who are either renting-out or selling land is significantly higher than the corresponding figures for the non-poor, yet it is no definite symptom of depeasantisation, since, neither all marginal and small operators are poor, nor is there absence of land purchase by this group. This finding goes very well with the results of Talib and Majid (1976) study which reported the absence of distress sale of land amongst the small farmers of the Punjab. Our results agree with their finding that, "To sum up, small farmers are not getting pauperised. On the contrary they, too, are doing rather well. The growth in their case, however, is less than the big farmers."

So the twin phenomena of 'land-shedding' and 'land-sucking' by both the 'small' and the 'big', reflect a bi-directional movement of the peasant households. Hence this dynamics ought to be interpreted as an in-built paradox of this 'awkward-class'.

The Table 5.4, further reveals that there is a significantly higher proportion of the poor participating in the local labour market, whereas, it is the other way round in the urban labour market. In addition, the crop yield index of above hundred weighs too heavily in favour of the non-poor. So the availability of better-paid jobs and
efficient performance on the farm front places the cultivating households in an advantageous position—granting them income to stay above poverty line.

A combined working of the leisure-preference of the rich, possession of disproportionately large holdings, and ownership of mechanical farm equipment finds expression in hiring of permanent labour by the relatively well-off operators.

In short, the inequality in the distribution of land holdings, productive wealth (both qualitatively as well as quantitatively) and employment avenues provide affluence on the current economic scene. The existence of current poverty, as per the chosen norm, in all the segments of the conventional four-fold classification of operational holdings, is a warning against unqualified support to the 'immiserization' and 'depeasantisation' theses. And, we may conclude with Kurien (1978, p.77) that ".......rural poverty is closely associated with the fact that a large proportion of the population has little or no claims on resources—their livelihood, therefore, depends precariously on how these who own resources utilize them."

The above stated conclusions, arrived at on the basis of a simple 'test-of-proportions' exercise, need thorough scrutiny for making statistically more confident
statements about empirical correlates of poverty. Several uni-variate and multi-variate exercises might be required to gain precision in identifying the rural poor. These aspects of the problem have been dealt with in Chapter 6.
Notes and References
(Ch.5)


3 C.F., Approach to the Fifth Five Year Plan, Planning Department, Punjab, Chandigarh, p.2; Fifth Five Year Plan (1962-74), New Delhi, p.7.

4 In Social Sciences, the process of change is so complex that one can come up with equally convincing alternative explanations of the same phenomenon by a suitable degree of reduction. In India, the twin phenomena of poverty and inequality have been


7 To the best of our knowledge, the survey undertaken by the Economic Adviser to Punjab Government for identification of Weaker Sections in Punjab (Sept.-Dec., 1980), was the first such attempt in the State, see, Govt. of Punjab (1981, op.cit.). However, later, Bhail and Chadha (1981, op.cit.) did estimate these figures for various Regions of the state.

8 The Planning Commission, in its Draft Sixth Plan 1978-83 (Revised), visualised an integrated plan of development at the block level, within which a special beneficiary-oriented plan for the poor was to be suitably fitted for 'increasing productivity through a strategy of growth with social justice and providing full employment to the rural sector within a ten year time frame.' The Draft added, 'As a comprehensive strategy and approach for translating these objectives into specific programmes the Integrated Rural Development, now contemplated, involves a multi-pronged
attack on the problem of rural development." For further details, see, Draft Sixth Five Year Plan 1978-83 and Sixth Five Year Plan 1980-82, Planning Commission, Government of India, New Delhi.

For a critical discussion on these points, see, Banerji, D., 'Measurement of Poverty and Undernutrition', EPW, September 26, 1981.


14 Ahluwalia (1978, op.cit.), gave an expenditure level of Rs. 43.40 per capita, per month, as poverty line for the year 1973–74 for Punjab–Haryana. His procedure of up-dating the poverty-line, by using the consumer price index for agricultural labourers, was adopted and the poverty norm of Rs. 696/- was obtained for the year 1979–80. A study of the Cultivator Households' Budget Surveys ESO, Punjab, Chandigarh, revealed that a margin of 10 per cent would suffice to ensure the purchasing power for other immediate needs. Hence, the poverty norm of Rs. 767.80. However, it might be added that we cannot escape the charge of being arbitrary in our choice of the poverty-line, since other poverty-lines were also available. See, for example, Sengupta, S. and Joshi, P.D., 'A Note on the Determination of Poverty-Line based on NSS 27th Round Data', Sarvekshana, July 1979; Gupta, S.P., Singh, Padam and Datta, K.L., 'Measurement of Poverty: A Development Index' in Planning Commission sponsored seminar: Regional Dimensions of India's Economic Development, 1982, Proceedings (1983).


20 See, Anand (1977, ibid.), pp.10-12 for application of this index.


23 The presentation of these axioms is based upon Sen (1981, op.cit.), Kundu and Smith (1981, op.cit.) and Clark, Hemming and Ulph (1981, op.cit.).

24 See, references cited in notes 16 to 20 above.


26 Right from the beginning of interest in the quantitative measurement of poverty, authors like Booth (1889) and Rowntree (1901) depended on the Head-Count Ratio as a measure of poverty. Later, Okhansky (1965), and Abel-Smith and Townsend (1965) followed the same tradition. Near home, Ojha (1970), Dandekar and Rath (1971), Minhas (1971), Bardhan (1971, 1973) and many others also adopted the same approach. However, since 1976 Sen's—P measure has become the mainstay of empirical studies on poverty. See, for instance, Ahluwalia (1978); Vyas et.al., (1981); Gaiha and Kamzi (1981); Tendulkar and Sundaram (1983); and Chadha (1984).

Since the needs of a family depend upon its demographic mix, therefore, it is desirable to reduce all entities into standard consumer equivalent units. The conversion scales have already been discussed, see note 11, Ch.3.

Here, a note of caution needs to be added. This pertains to the treatment of poverty as a permanent condition or merely a phase in the life-cycle of a household, for certain groups of households. If poverty is treated as a permanent condition then filling the gaps just for once is enough. On the contrary, if poverty is taken as a transitory phenomenon linked up with the declining or decaying phase of the peasant households, which seems to be a more realistic approach, then once is not enough. The latter alternative, i.e., treating poverty as a transitory phenomenon, can create a status-quoist trap—to wit: whatever comes naturally, passes naturally.

Though not much work has been done on the growth and decay of farm families in India but it was often suggested that one should study the movement of families rather than farms. For the views of Prof. Dantwala and Rao, see, Junankar, P.N., 'Green Revolution and Inequality', EPW (ROA), March 29, 1975. Gaia and Kasmi (1981, op.cit.) have tried to incorporate this point in a roundabout manner. For a recent study on the subject, see, Shergill, H.S., 'Physiognomy and Anatomy of Growing, Decaying and Static Farms in Punjab', EPW (ROA), March 30, 1985.

Even if we go in for a radical redistribution of assets and land at a particular juncture, some farm families would again slide down and might run a consumption deficit. Given such a large number of farm families in India, a section would require state help to mitigate poverty. For this type of dynamics, see, Malson, J., The Mobility of Farm Families, Manchester University Press, Manchester, 1968. For a typical illustration of this process, due to Lipton (1981), see, Gaia and Kasmi (1981, op.cit.) footnote 29.

Scott (1981, op.cit.) comes out with a very harsh statement on this point. For, he writes, 'The discussion below uses empirical data to show that with quite reasonable variations in definition and concepts the amount of poverty in one country can be
made to vary from 26 to 85 per cent for the same year. Poverty can also be shown according to the researcher's intent and, without undue violation of the truth, to be declining or increasing over time. See pp. 13-26, for some interesting examples.

32 For a scathing criticism of the existing procedures and a plausible alternative, see Banerji, D., 'Measurement of Poverty and Undernutrition', EPW, September 26, 1981.


34 These indices are well illustrated and discussed in detail in Kahlon and Singh (1980, op.cit.), pp. 90-99.

35 Darling (1925, op.cit.), p. 246, observed that, 'It is unnecessary to recapitulate the causes of debt, but in examining them we saw that debt was allied to prosperity and poverty alike....' We also observed the same in our study though, we had a different explanation for this phenomenon. So the note of caution that indebtedness and poverty should not be taken as synonymous, much less, linking the two with caste. The reasons for high incidence poverty amongst the scheduled castes lie in their being mainly small and marginal farmers and share croppers with very low literacy rates. See, for instance, Report on the Socio-Economic Conditions of Scheduled Castes in Punjab (1966-67), ESO, Punjab, Chandigarh; Agricultural Census, Punjab, 1950-51; Rao, C.H. Hanumantha (1965, op.cit.).

36 For a somewhat similar conclusion on the cropping pattern see, Balila and Chadha (1983, op.cit.), pp. 38-43.

37 Researchers like Vyas (1970), Bhardwaj and Bass (1975) and Hardman (1976) suggest that, in green revolution areas like Punjab, a typical tenant is not a small farmer but a big farmer guided by the commercial motive. So much so that, even the National Commission on Agriculture has accepted this appreciable change (see, Report of the National Commission on Agriculture, Government of India, New Delhi, 1972, Part IV, p. 148).
But, in the light of our experience, a much more thorough micro-level study is required to understand the factors that influence the land leasing-in decision of cultivating households. For a macro level study, see, Grewal, S.S. and Rangi, P.S., 'An Analysis of Agrarian Structure in the Punjab', _IJAE_, October-December, 1981.

Hayami, Yujiro, in his 'Agrarian Problems of India—An East and South-east Asian Perspective', _EPW_, April 18, 1981, observed low rates of return to labour due to low level of technology and scarce endowments of land and capital relative to labour, and unequal distribution of assets, especially land, as the basic root of poverty and inequality. In the light of our findings, we tend to agree with him, so far as current inequality and poverty are concerned.