Confronting Poverty in Developing Countries

Definitions, Information, and Policies

Paul Glewwe
Jacques van der Gaag
LSMS Working Papers

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(List continues on the inside back cover)
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Definitions, Information, and Policies
The Living Standards Measurement Study

The Living Standards Measurement Study (LSMS) was established by the World Bank in 1980 to explore ways of improving the type and quality of household data collected by statistical offices in developing countries. Its goal is to foster increased use of household data as a basis for policy decisionmaking. Specifically, the LSMS is working to develop new methods to monitor progress in raising levels of living, to identify the consequences for households of past and proposed government policies, and to improve communications between survey statisticians, analysts, and policy makers.

The LSMS Working Paper series was started to disseminate intermediate products from the LSMS. Publications in the series include critical surveys covering different aspects of the LSMS data collection program and reports on improved methodologies for using Living Standards Survey (LSS) data. More recent publications recommend specific survey, questionnaire and data processing designs, and demonstrate the breadth of policy analysis that can be carried out using LSS data.
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CIP
This paper examines several commonly used definitions of poverty. We first propose a definition based on the theory of welfare economics and contrast it with other definitions that are often used in empirical studies. We then examine household survey data from Côte d'Ivoire to see whether these different definitions choose the same people as poor. The general finding is that they often do not choose the same people. This implies that different definitions of poverty will often lead to different policy recommendations. The paper then provides a general discussion of poverty-reducing policies, and demonstrates the use of household survey data to formulate and evaluate specific policies.
This paper is based on the Côte d'Ivoire Living Standards Survey, which was conducted in 1985 by the World Bank's Living Standards Unit and the Direction de la Statistique, Ministère de l'Economie et des Finances of the Republic of Côte d'Ivoire. We would like to thank Dennis de Tray and R.P. Singh for helpful discussion and comments. We are also indebted to Brenda Rosa for typing several drafts of this paper.
# TABLE OF CONTENTS

I. Introduction.................................................................1

II. Measuring Welfare and Defining Poverty.................................3  
   Measuring Welfare.........................................................3  
   Alternative Definitions of Poverty....................................5

III. Identifying the Poor: Comparing Alternative Definitions  
     of Poverty...............................................................10  
     Procedure for Comparing Poverty Definitions......................12  
     Comparing Poverty Definitions in Urban  
     Côte d'Ivoire............................................................13  
     Comparing Poverty Definitions in Rural  
     Côte d'Ivoire............................................................21

IV. Poverty Identification for Policy Formulation.......................28  
    Three types of Policies and Their  
    Information Requirements..............................................28  
    Advantages and Disadvantages.........................................30

V. Policies to Reduce Poverty: The Case of Côte d'Ivoire.............35  
    Characteristic Profile of the Poor..................................35  
    Suggested Policies to Reduce Poverty................................39

VI. Conclusion........................................................................43

References...............................................................................45
I. INTRODUCTION

"...the World Bank is ready to play a reinvigorated role in the fundamental tasks of development: to promote economic growth and to combat poverty... Restoring and strengthening growth are essential for achieving our greatest goal - to reduce the poverty, misery, and destitution that blight our world."

Barber B. Conable
President, The World Bank
September 29, 1987

"...the common goal pursued by the international community [is] realizing... the enjoyment of the economic, social and cultural rights indispensible for the development of the human condition...especially in regard to food, clothing, housing, education, health care, and necessary social services."

United Nations General Assembly
Resolution (40/179)
December 17, 1985

Reducing poverty is accepted as a major objective of economic development. Economic growth is generally considered to be a necessary condition for alleviating poverty (Bhagwati, 1985). Yet it has been increasingly recognized in the past two decades that growth alone may not be sufficient to bring about substantial reductions in levels of poverty (Stewart, 1985). Thus, in many developing countries, growth-promoting policies are supplemented with policies specifically designed to improve the lot of the poor. Assessing the effectiveness of both types of policies in reducing poverty, and formulating and implementing the latter policies, requires an information base that goes well beyond the standard indicators of a country's macroeconomic performance.

In this paper we review seven of the most commonly used definitions of poverty. First we propose a definition based on the theory of welfare economics and then apply it to household survey data from Côte d'Ivoire. We compare the population identified as poor by this definition of poverty with
populations designated as poor using commonly employed but less comprehensive ("short-cut") definitions of poverty. The message from this exercise is clear: different definitions of poverty select different population groups as poor. The importance of this finding is that different definitions of poverty can lead to the design of very different policy measures to alleviate poverty. After a general discussion of poverty-reducing policies and their information requirements, we demonstrate for Côte d'Ivoire how household survey data can be used to evaluate, and indeed help formulate, policies that attempt to remove both the causes and the consequences of poverty.
II. MEASURING WELFARE AND DEFINING POVERTY

Poverty has traditionally been defined as a discrete characteristic—either one is poor or one is not. Given a particular indicator of welfare, a certain line or standard is drawn, and an individual or household falls on one side or the other. Analysis of poverty takes place at two different levels. Defining poverty consists of classifying the population into the poor and the non-poor. Measuring poverty seeks to aggregate the "amount" of poverty into a single statistic. This paper is concerned with definitions of poverty and their implications for choosing policies to reduce poverty. Measuring poverty in the sense of choosing one aggregate statistic will not be addressed.1/

Measuring Welfare

In welfare economics, the starting point for the measurement of economic welfare is the utility function, which states that the consumption of goods and services raises welfare. It is assumed that each individual or household possesses the same utility function. If this were not true, it would be impossible, even meaningless, to compare welfare among people. Because consumption data are often collected at the household level, it is convenient to work with a household utility function. Of course, one should ultimately identify the poor in terms of people, not households. But with only household level consumption data available, one has little choice but to assume that all members of each household enjoy the same level of economic well-being. Regrettably, this ignores the important question of the intra-

1/ See Foster (1984) for a recent review of aggregate poverty measures.
household distribution of consumption (see Deaton, 1987, and Sen, 1984).

Given a household utility function, household welfare levels can be compared using cost functions, which specify the amount of money required by a utility-maximizing household to obtain a given level of welfare (cf. Deaton and Muellbauer, 1980). This allows one to compare households' welfare levels, which one cannot observe, by comparing their consumption levels, which one does observe. Household consumption is usually measured in terms of expenditures on goods and services, yet it also takes other forms, such as crops grown and consumed by the household, the use value of durable goods, and the imputed rents for owner-occupied housing. In this paper these items are always included in the consumption measure used.2/ The major shortcoming of a consumption-based welfare measure is that welfare derived from leisure and pure public goods is ignored (Deaton and Muellbauer, 1980).

After a comprehensive measure of household consumption is constructed, two more issues must be discussed: adjustment of household welfare for differences in household composition, and the time horizon over which to define poverty. Total household consumption is likely to overstate the welfare level of persons in large households, since the goods and services consumed must be divided among more people.3/ The most common adjustment made is to use per capita consumption. This may underestimate welfare levels.


3/ The general issue here is how to compare welfare levels among households living under different circumstances. This includes not only adjusting for family size, (see, for instance, Van der Gaag and Smolensky, 1982), but also for price differences (cf. Allen, 1975) and even differences in climate (van Praag, 1987). In this paper all data are adjusted for regional price differences. See Glewwe (1987a) for more details.
because possible returns to scale and the benefits of joint consumption are ignored. To correct for this, one can estimate household equivalence scales, which give lower weights to additional household members (especially children) when dividing the value of household consumption by household size.  

Finally, the time horizon for measuring poverty must be considered. Many people in developing countries suffer from chronic poverty. Others experience temporary setbacks from economic recession or personal misfortune. Policy-makers are concerned with both types of poverty. There are also practical considerations. A period of less than one year is prone to systematic influences from seasonal patterns in economic activities, particularly in the agricultural sector. However, the data requirements for measuring welfare over longer periods are very large. As a compromise, this paper will adopt a household's consumption over a one-year period as the starting point of poverty analysis.

Alternative Definitions of Poverty  
We argued above that per capita consumption, adjusted by household equivalence scales to control for differences in household composition, is a desirable measure of household welfare. When one decides where to draw the poverty line, one obtains a definition of poverty. This will henceforth be

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4/ For the theoretical foundation of household equivalence scales see Deaton and Muellbauer (1980, 1986). The latter discusses their use in LDCs.

5/ This leads to the issue of whether one is defining poverty in absolute or relative terms. This distinction is often imprecise. In our opinion, one cannot eliminate the subjective element when drawing the line, so that any poverty line involves value judgments of some kind. Thus, any poverty line is relative in that it reflects the values held by those who draw the line.
referred to as the "adjusted per capita consumption" definition. The remainder of this subsection reviews nine other often-used definitions of poverty. Each definition is in fact a proposed indicator of welfare; when a cut-off point is chosen a definition of poverty is created.

1. Per capita income. Household income, especially per capita income, is commonly used as a welfare indicator, yet there are two main criticisms of its use in defining poverty. The theoretical objection is that in many developing countries, the incomes of a large portion of the population may vary from year to year. The incomes of agricultural cultivators are the best example. Both common sense and the permanent income hypothesis (Friedman, 1957) suggest that there is a strong tendency for people with variable incomes to save in abundant years and to dissave in lean ones. Thus, a given year's income may not match a household's average level of welfare as generated by the consumption of goods and services over time. The practical problem of using income to indicate welfare lies in the measurement of incomes of people who operate their own farm or business. Records of family businesses are often not kept, and the concept of profit itself is unclear. These arguments are less convincing for wage earners for whom reliable income data can usually be obtained. However, wage earners form only a small portion of the population in LDCs, while the permanent income argument still holds.

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6/ For the remainder of this paper, the term "consumption" includes not only explicit purchases of goods and services, but other private consumption, including consumption of home-produced food, imputed rents for owner-occupied housing in urban areas, the use value of durable goods, and so on.
2. **Household consumption and per capita consumption.** Household consumption expenditures is a particularly attractive welfare indicator because of its sound theoretical basis, as argued above. While theoretical considerations call for the use of household equivalence scales to adjust for household size, calculating such scales is controversial (Pollack and Wales, 1979; Deaton and Muellbauer, 1986). This controversy is often avoided by using either total consumption or per capita consumption.

3. **Per capita food consumption.** Some economists (for example, Anand and Harris, 1985) propose per capita food consumption as a measure of welfare. One advantage is that the data requirements are fewer. Non-food consumption can be ignored, and associated problems, such as estimation of the value of owner-occupied housing, are circumvented. Second, food consumption may be more accurately reported in household surveys than non-food consumption. Third, it is often easier to construct food price indices than to make price comparisons for non-food items. Yet the major strength of this method, its focus on food alone, is also a serious weakness: the consumption of non-food necessities such as clothing and shelter is ignored. Moreover, the measure depends directly on a household's propensity to consume food, which may vary across households.

4. **Food Ratio.** Another welfare indicator is the food ratio, the fraction of the household budget spent on food. The popularity of this measure stems from two observations by Engel (1895), who noted that the food ratio was inversely related to the size of a household's total budget, and that it increased with family size. Based on the former observation, Engel hypothesized that the food ratio can serve as a welfare indicator. The second
observation is often used as a basis for calculating household equivalence scales. Indeed, one of the appealing properties of the food ratio as a welfare indicator is that there is no need to adjust for household size or any other difference in household characteristics. Despite its attractive properties, recent research has shown that the first observation ("Engel's first law") may not always hold for the poorest households in developing countries (Thomas, 1986). This casts serious doubt on the use of this welfare indicator as a definition of poverty.

5. Calories. Others have suggested that food consumption data should be used to directly focus on calorie intake rather than on food expenditures or the fraction of a household's budget spent on food. The appeal of this approach is that it has a certain objective foundation in nutritional studies (Jelliffe and Jelliffe, 1979). Yet the objectivity of calorie-based definitions of poverty has been challenged (see Srinivasan, 1981; Sen, 1981, chapter 2; and Lipcon, 1980), and the data requirements are very large. Finally, focusing on calories again omits the non-food component of economic welfare.

6. Medical data. One set of indicators that may have practical relevance comprises medical indicators of health and nutritional status. These include anthropometric measures to determine the incidence of stunting (low height for age) and wasting (low weight for height), as well as medical tests (see examples cited in Berg, 1987). These measures are particularly relevant when focus is on the adverse effects of poverty on young children. While it is fairly easy to obtain height and weight data in household surveys, other medical data may be difficult to gather. In addition, using medical data to define poverty may be misleading, because although health is
correlated with household welfare, it is not identical to it. Yet from a practical point of view, if one finds that poverty, as measured by consumption data, is highly correlated with health, it may be helpful to use medical data to identify the poor.\textsuperscript{7/}

7. Basic Needs. Another approach to determining the economic well-being of a household is the basic needs concept (cf. Streeten, 1981 and Stewart, 1985). Rather than determining the total consumption of a household, or accepting a proxy measure for this concept, households are defined as poor if their food, clothing, medical, educational, and other needs are not met. Such needs are exogenously defined, for example, by groups of experts on nutrition, health care, shelter, and so on. There is usually no attempt to aggregate these various aspects of basic needs into a single welfare indicator, which complicates the classification of households as poor and non-poor.\textsuperscript{8/} A second problem with this approach is the subjectivity involved in determining adequate levels of health care, housing, education, cultural amenities, and so on.

\textsuperscript{7/} Of course, improvements in health may be a government objective regardless of the economic status of the unhealthy population. This paper will concentrate on poverty per se. The relationship between health and poverty will be taken up below.

\textsuperscript{8/} One could argue that this simply reflects the fact that poverty is a multidimensional concept, and that efforts to aggregate are misleading.
III. IDENTIFYING THE POOR: COMPARING ALTERNATIVE DEFINITIONS OF POVERTY

As explained in the previous section, the adjusted per capita consumption definition of poverty has a strong basis in economic theory. Consumption as a measure of welfare also has a strong intuitive appeal. Yet a less complicated definition of poverty could be used if it identified the same people as poor as does the consumption definition. This important question can only be resolved empirically. In this section we use data from the 1985 Cote d'Ivoire Living Standards Survey (CILSS) to see which "alternative" definitions of poverty produce results similar to those generated by the adjusted per capita consumption definition. This survey is fully described in Ainsworth and Munoz (1986) and Grootaert (1986). Details on the consumption data used here are in Glewwe (1987). Although some of the results may be specific to Côte d'Ivoire, some general lessons can be drawn.

The alternative definitions of poverty that will be compared in this section are summarized in Table 1. A few comments are in order. First, the construction of household equivalence scales for Côte d'Ivoire is beyond the scope of this paper. We will employ equivalence scales consistent with those estimated by Deaton and Muellbauer (1986). Adults are counted as 1.0, and the weights given to children are 0.2, 0.3 and 0.5 for the ages 0-6 years, 7-12 years, and 13-17 years, respectively. Second, the data on food consumption were judged inadequate for applying the caloric definition of poverty, because they are measured in terms of expenditures rather than quantities, and the prices of only some items were collected. Third, the income variable used is very comprehensive. It includes wages paid to employees (including payments in kind), estimated incomes of the self-employed, annual income from agricultural pursuits (including sales of livestock), income received from a
TABLE 1: Poverty Definitions Examined Using the Côte d'Ivoire Data

<p>| | |</p>
<table>
<thead>
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<tbody>
<tr>
<td>1</td>
<td>Income per capita</td>
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<tr>
<td>2</td>
<td>Total household consumption</td>
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<tr>
<td>3</td>
<td>Per capita consumption</td>
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<tr>
<td>4</td>
<td>Per capita food consumption</td>
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<tr>
<td>5</td>
<td>Food ratio</td>
</tr>
<tr>
<td>6</td>
<td>Average weight for height Z-score of children aged 0-9</td>
</tr>
<tr>
<td>7</td>
<td>Average height for age Z-score of children aged 0-9</td>
</tr>
<tr>
<td>8</td>
<td>Floor area of dwelling per capita</td>
</tr>
<tr>
<td>9</td>
<td>Average education level of adult household members</td>
</tr>
<tr>
<td>10</td>
<td>Agricultural land per capita</td>
</tr>
</tbody>
</table>

family enterprise as estimated by the workers, imputed rents in urban areas, use value of durables, consumption of agricultural products grown by the household, and income from remittances, investments, and other sources. Fourth, the following welfare indicators were chosen to compare the basic needs approach with the consumption approach: floor area per capita, the average education level of adult household members, and in rural areas — agricultural land per capita. Other basic needs indicators that may be more representative of this approach were not used for one of the following reasons: (a) they classified most of the population as poor (for example, access to piped water); (b) they could not be clearly identified using the CILSS data (for example, adequate nutritional intake); or (c) it was not clear how they should be implemented (for example, clothing needs met). While the
three basic need indicators used here may not do justice to the basic needs approach, we hope that they may still be useful for evaluating the approach's strengths and weaknesses. Note also that some of the other indicators, such as food consumption and medical data, can be given a basic needs interpretation. Fifth, the only CILSS medical data are weight and height measurements, which are normalized by age and sex using Z-scores (see Strauss, 1987).

Procedure for Comparing Poverty Definitions

In comparing these definitions of poverty we must answer two questions: (a) Do they select the same people as poor as the adjusted per capita expenditure definition? (b) Do they choose people with the same characteristics as the theoretically preferred definition? We will answer these questions for urban and rural areas separately, since poverty takes very different forms in both.

Before proceeding, one must decide where to draw the poverty line to transform welfare indicators into definitions of poverty. It may be that the characteristics of the poor will be different for different intensities of poverty (see, inter alia, Glewwe, 1987a). That is, the "extremely poor" may have different characteristics from the "generally poor." While this is an interesting question in itself, it is a separate issue from the concern of this paper. (See for example, Lipton (1983) for a comprehensive discussion of extreme poverty). In this paper we have set all poverty lines so that they define 30 percent of the population as poor.

When comparing two poverty definitions, four outcomes are possible. First, both may classify a household as poor. Second, both may classify a
household as non-poor. Third and fourth, outcomes occur when one definition classifies a household as poor and the other does not. One can compare two definitions by the percentage of households classified consistently as poor or non-poor by both (outcomes 1 and 2). If two poverty definitions are in complete agreement, this figure will be 100 percent. If two poverty definitions are completely uncorrelated, and both poverty lines are drawn at the 30 percent cutoff point, the figure will be 58 percent. We will test for no correlation between the different definitions using a chi-square test.

Comparing Poverty Definitions in Urban Côte d'Ivoire

1. Correlation Among Poverty Definitions. Table 2 provides information on the correlation between poverty as defined by adjusted per capita consumption and the alternative definitions of poverty given in Table 1. The first two columns give percentages of the total population (in terms of people, not households) who are classified by both definitions as poor and non-poor, respectively. If a definition chooses the same people as poor and non-poor as does the adjusted per capita consumption definition, these numbers would be 30 percent and 70 percent. The third column gives the percentage of

[9/ Given this number, one can easily calculate the percentage of households in all four outcomes.

10/ Given an initial definition of poverty, a statistically random alternative definition of poverty will result in 49 percent (0.7 x 0.7) of the population being chosen non-poor by both measures and 9 percent (0.3 x 0.3) chosen as poor by both measures.

11/ The basic essentials of this test can be found in Snedecor and Cochrane (1967, pp. 215-16). The statistical theory is discussed in Mood, Graybill, and Boes (1974, pp. 452-61).
population unambiguously classified as either poor or non-poor. The last column gives the $\chi^2$ statistic for rejecting the hypothesis that the definition of poverty is uncorrelated with the preferred definition.

Table 2 reveals that some definitions of poverty are much more strongly correlated with the theoretically preferred definition than others. Any definition that fails the $\chi^2$ test is clearly a poor definition, at least in the Côte d'Ivoire. This is the case for the two anthropometric indicators, height-for-age and weight-for-height. We should note here that Côte d'Ivoire does not generally suffer from a lack of food for its population; average daily calorie supply in 1985 was 2,505 calories per day (World Bank, 1987b), which is about 110 percent of the recommended requirement. Simply put, children in Côte d'Ivoire are relatively well nourished even among the poor (cf. Strauss, 1987), so there is little correlation between poverty and indicators of nutritional status. Of course, this may not be true of countries where nutritional problems are more severe. But the lesson here is an important one: reducing poverty and reducing malnutrition are not the same thing, and government revenues may have to be split between those two objectives.

Three poverty definitions are only weakly correlated with the adjusted per capita consumption definition: the food ratio, per capita floor area, and the average educational level of adults. Of the 30 percent of the population who are defined as poor by the theoretically preferred definition, less than half are identified as such by these definitions. The fact that the two basic needs indicators are not well correlated with the comprehensive consumption definition of poverty does not necessarily mean that the basic needs approach to measuring living standards is somehow flawed; it simply
TABLE 2: Correlation of Alternative Definitions of Poverty with the Adjusted Per Capita Consumption Definition: Urban Côte d'Ivoire

<table>
<thead>
<tr>
<th>Definition</th>
<th>Percentage of Population Accurately Identified</th>
<th>$\chi^2$ Statistic (d.f. = 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Poor</td>
<td>Non-Poor</td>
</tr>
<tr>
<td>Per capita income</td>
<td>16.80</td>
<td>56.85</td>
</tr>
<tr>
<td>Household consumption</td>
<td>17.67</td>
<td>57.84</td>
</tr>
<tr>
<td>Per capita consumption</td>
<td>26.08</td>
<td>66.12</td>
</tr>
<tr>
<td>Per capita food consumption</td>
<td>22.64</td>
<td>62.67</td>
</tr>
<tr>
<td>Food ratio</td>
<td>14.23</td>
<td>54.24</td>
</tr>
<tr>
<td>Height for age</td>
<td>8.70</td>
<td>49.47</td>
</tr>
<tr>
<td>Weight for height</td>
<td>8.95</td>
<td>49.01</td>
</tr>
<tr>
<td>Per capita floor area</td>
<td>13.26</td>
<td>53.48</td>
</tr>
<tr>
<td>Adult school attainment</td>
<td>13.41</td>
<td>53.69</td>
</tr>
</tbody>
</table>

Notes:
1. One asterisk denotes that the hypothesis of no correlation is rejected by the chi-square test at the 1 percent level.
2. The power of the chi-square test to reject the hypothesis is lower for the height-for-age and weight-for-height definitions, since they are based on only 199 (as opposed to 667) households.

means that these two basic needs indicators should not be taken as definitions of poverty. The food ratio is also not strongly correlated with the adjusted per capita consumption definition. This seriously calls into question the assumption that the food ratio is strongly correlated with welfare rankings.

Two poverty definitions that perform better are per capita income and total household consumption. That total household consumption does not account for differences in household size is a serious flaw, but it is noteworthy that this definition does better than per capita income. The two definitions of poverty that correspond most closely to the adjusted per capita consumption definition are (unadjusted) per capita consumption and per capita food consumption. This indicates that, at least in Côte d'Ivoire, it may not
be necessary to estimate adult equivalence scales when dividing the value of household consumption by household size. Furthermore, if information on non-food consumption is lacking, per capita food consumption may be used as a reasonable proxy to identify the poor.

At this point a few remarks are in order regarding the resource cost of using alternative definitions of poverty. As one might expect, the easiest definitions to apply (that is, those that require the least information) are also the least accurate; height-for-weight, weight-for-height, per capita floor area and average educational attainment of adults are relatively easy to measure but they are poorly correlated with the adjusted consumption definition of poverty. Note also that the food ratio, which requires as much data as several of the more accurate definitions, is also a poor candidate in terms of accuracy. Another definition of dubious usefulness is per capita income. Although some income data (wages for instance) may be easier to collect than expenditure data, accurate measurement of total household income is difficult. Even when one takes as much care as was taken in measuring income in the CILSS, the resulting definition is likely to be less accurate than household consumption unadjusted by household size. Finally, it seems clear that the household consumption definition should not be used, since it is trivial to divide it by household size. It is unfortunate that this definition is still so often used (cf. technical note to Table 26 in World Bank, 1987b).

2. Characteristics of the urban poor by different definitions of poverty. Rather than simply looking at the overlap (or lack thereof) between the groups identified by the various definitions as poor or non-poor, one can focus on the characteristics of the poor in the terms of family size, regional
distribution, employment status, and so on. If, for instance, all poverty measures show a strong association between poverty and illiteracy, education policies that address the illiteracy problem will benefit the poor, no matter how they are identified. On the other hand, if the regional distribution of poverty depends heavily on the poverty measure chosen, poverty alleviation measures that are based on this regional distribution will be conditioned by the definition of poverty, which is a highly undesirable outcome.

In Table 3 we present selected characteristics of the urban poor in Côte d'Ivoire that result from the different poverty definitions discussed above. For comparative purposes, the characteristics of a typical Ivorian household are given in the first column. The height-for-age and weight-for-height definitions are not in Table 3, as they were statistically uncorrelated with the adjusted consumption definition. A detailed discussion of the characteristics of the poor as defined by adjusted per capita consumption is given in Glewwe (1987a). The discussion here is limited to differences that result from using the alternative definitions.
<table>
<thead>
<tr>
<th></th>
<th>Adjusted Per Capita Expenditures (CFA per year)</th>
<th>Household Composition</th>
<th>Characteristics of Head</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Adjusted Per Capita</td>
<td>Entire Rental Income</td>
<td>Food Consumption</td>
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<td></td>
<td>Per Capita</td>
<td>Per Capita</td>
<td>Food Consumption</td>
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<td>Per Capita</td>
<td>Per Capita</td>
<td>Floor Area</td>
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<td>Per Capita</td>
<td>Household Consumption</td>
<td>Adult Education</td>
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### Table 3 continued

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<td>41.6</td>
<td>28.7</td>
<td>37.2</td>
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<td>Other Urban</td>
<td>54.5%</td>
<td>74.6</td>
<td>71.3</td>
<td>62.9</td>
<td>58.4</td>
<td>71.3</td>
<td>62.8</td>
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<td>Nationality/Ethnicity:</td>
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<td>Krou</td>
<td>11.9%</td>
<td>10.8</td>
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<td>14.6</td>
<td>7.9</td>
<td>9.4</td>
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<td>North Mande</td>
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<td>South Mande</td>
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<td>4.8</td>
<td>3.1</td>
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<td>Burkina</td>
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<td></td>
<td>Mali</td>
<td>6.3%</td>
<td>9.0</td>
<td>8.7</td>
<td>10.4</td>
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<td>9.1</td>
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<td>Other</td>
<td>6.5%</td>
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<td>5.8</td>
<td>7.2</td>
<td>6.8</td>
<td>4.2</td>
<td>7.5</td>
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<tr>
<td>Possession of car</td>
<td>21.7%</td>
<td>5.4%</td>
<td>5.4</td>
<td>9.0</td>
<td>0.7</td>
<td>13.3</td>
<td>5.4</td>
<td>13.0</td>
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<tr>
<td>Possession of motorcycle/ scooter</td>
<td>14.2%</td>
<td>19.0%</td>
<td>21.6</td>
<td>15.8</td>
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All figures are defined on a per capita basis, rather than per household.
Household size varies substantially over different definitions: the per capita consumption and per capita food consumption definitions choose larger households as poor, while the household consumption definition chooses relatively small households. This is not surprising. What is interesting is that after giving substantially smaller weights for children (adjusted consumption per capita) one still finds relatively large households selected as poor. Thus, adjusting for household size by using per capita measures does not seem to result in a bias towards choosing large households as poor. Note also that the food ratio and adult education poverty definitions choose smaller households as poor.

A better understanding of differences across the various poverty definitions in terms of employer and occupation characteristics of heads of households is obtained if one first examines the region in which the poor live. The adjusted per capita consumption definition finds that nearly 75 percent of the urban poor live in cities other than Abidjan, as do those selected by the per capita consumption and per capita food consumption definitions. Yet other definitions find relatively more poor in Abidjan. The floor area definition shows the largest bias. It appears that higher housing costs in Abidjan lead households there to choose smaller dwellings. The household consumption definition also finds a relatively large number of urban poor in Abidjan. This comes about because it chooses relatively small households as poor, and such households are more likely to be found in Abidjan (household size is 10.8 in Abidjan and 14.1 in other urban areas).

Returning to the employment information on heads of households, we see that Abidjan has more government and white collar jobs than do other urban areas. Agricultural pursuits are rare in Abidjan, but common in other urban
areas. Thus, the tendency of some definitions of poverty to find more poor in Abidjan favors households in which the head works for the government (or for a private employer) over households with self-employed heads. In terms of occupations, those definitions select as poor more households with white collar heads and fewer households headed by agricultural workers.

In summary, poverty definitions that are weakly correlated with the theoretically desirable adjusted per capita consumption definition do not automatically choose households with different characteristics, but in practice this is often the case. Some poverty definitions have clear biases that in turn can have serious implications for the choice of policies aimed at poverty alleviation.

Comparing Poverty Definitions in Rural Côte d'Ivoire

This subsection will repeat the analysis of the previous subsection for rural areas of Côte d'Ivoire. The same definitions of poverty are used, except that another basic needs definition has been added: the agricultural land (in hectares per capita) used by the household. To save space we will restrict the discussion of our results to the bare minimum.

1. Correlation among poverty definitions. Table 4 presents data on the correlation of the alternative poverty definitions with the theoretically preferred adjusted per capita consumption definition. The first four definitions perform similarly to those in Table 2 for urban Côte d'Ivoire. Per capita consumption is most closely correlated with adjusted per capita consumption, followed by per capita food consumption, total household consumption, and per capita income. As in urban areas, total household consumption is more strongly correlated than per capita income, even though no
adjustment is made for household size. This again suggests that per capita income is not a reliable definition of poverty.

### TABLE 4: Correlation of Alternative Definitions of Poverty Relative to the Adjusted Per Capita Consumption Definition: Rural Côte d'Ivoire

<table>
<thead>
<tr>
<th>Definition</th>
<th>Percentage of Population Accurately Identified</th>
<th>$\chi^2$ Statistic</th>
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<tbody>
<tr>
<td></td>
<td>Poor</td>
<td>Non-Poor</td>
</tr>
<tr>
<td>Per capita income</td>
<td>17.70</td>
<td>57.60</td>
</tr>
<tr>
<td>Household consumption</td>
<td>19.93</td>
<td>59.90</td>
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<tr>
<td>Per capita consumption</td>
<td>26.43</td>
<td>66.38</td>
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<tr>
<td>Per capita food consumption</td>
<td>22.84</td>
<td>62.85</td>
</tr>
<tr>
<td>Food ratio</td>
<td>10.19</td>
<td>50.17</td>
</tr>
<tr>
<td>Height-for-age</td>
<td>10.82</td>
<td>51.21</td>
</tr>
<tr>
<td>Weight-for-height</td>
<td>9.56</td>
<td>50.07</td>
</tr>
<tr>
<td>Per capita floor area</td>
<td>7.57</td>
<td>47.51</td>
</tr>
<tr>
<td>Adult schooling</td>
<td>11.89</td>
<td>51.71</td>
</tr>
<tr>
<td>Agricultural land per capita</td>
<td>11.94</td>
<td>52.00</td>
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</table>

Note: 1. See the notes to Table 2. The power of the $\chi^2$ test to reject the null hypothesis is weaker for the height-for-age and weight-for-height poverty definitions, since they are based on only 286 and 285 households, respectively, as opposed to 902 households for the other definitions.

As in urban areas, neither the height-for-age nor the weight-for-height definitions of poverty are significantly correlated with the adjusted per capita consumption definition. More surprisingly, the food ratio and the per capita floor area definitions are also uncorrelated. Perhaps in rural areas there is not enough variation in welfare levels to bring about large variations in the food share.\(^{12/}\) The problem with the floor area definition may be that housing quality, rather than dwelling size, adjusts in response to

\(^{12/}\) The average food share in rural areas is relatively high, 60-65 percent, of which 30 percent is from food produced at home. (See Glewwe, 1987a).
differences in welfare. In any case, this definition seems to be a poor substitute for a consumption-based definition.

The last two poverty definitions in Table 4, average schooling of adults in the household and agricultural land per capita, are mildly correlated with the theoretically preferred poverty definition - both pass the $\chi^2$ test, but are weak in their ability to identify the poor. It should be noted that due to the lack of educated adults in rural areas, it was necessary to include all household members age 10 and above to keep the number of poor at about the 30 percent level. The necessity for doing so is not just an inconvenience, but is an inherent weak point of this definition of poverty.

2. Characteristics of the Rural Poor by Different Definitions of Poverty. Table 5 gives the characteristics of the rural population as defined by the different measures. Definitions which fail the $\chi^2$ test are omitted from the table.

The differences among the various poverty definitions regarding household composition are similar to what they were in urban areas. Again, the per capita consumption and the per capita food consumption definitions select as poor relatively large households, while the household consumption definition identifies smaller households as poor. The adjusted per capita expenditure definition select as poor relatively large households, indicating that the bias of the per capita definitions towards choosing large households is not strong.

---

13/ Eighty percent are illiterate, and average years of schooling is a mere 1.4 years.
### TABLE 5: Characteristics of Rural Poor by Different Definitions of Poverty

<table>
<thead>
<tr>
<th>Adjusted Per Capita Expenditures (CFA per year)</th>
<th>Entire Population</th>
<th>Adjusted Per Capita Consumption</th>
<th>Per Capita Consumption</th>
<th>Per Capita Income</th>
<th>Per Capita Household Consumption</th>
<th>Per Capita Food Consumption</th>
<th>Per Capita Adult Education</th>
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#### Household Composition

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<td>0.0</td>
<td>2.0</td>
<td>91.5</td>
<td>6.7</td>
<td>87.9</td>
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<td>88.9</td>
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Continued
Table 5 continued

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<th>Per Capita Adult Education</th>
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<td></td>
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</tr>
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<td>41.4</td>
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<tr>
<td>Other</td>
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<td>2.1</td>
<td>3.2</td>
<td>2.3</td>
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</table>

Agricultural Land Per Capita (hectares)
- 0.8656 0.6173 0.5541 0.5106 0.7556 0.5857 0.8085 0.2425
- 0.2424 0.0971 0.0853 0.0627 0.1005 0.1241 0.1328 0.0569
- 0.2527 0.1536 0.1420 0.1102 0.1902 0.1627 0.1807 0.0395

Percentage of Households with:
- Cocoa Land 48.3% 29.0% 30.6% 22.8% 23.4% 41.9% 22.6% 18.4%
- Coffee Land 53.4 33.4 36.8 33.5 35.4 42.5 30.3 26.1
- Either Cocoa or Coffee Land 65.1 44.3 47.0 40.2 42.6 54.1 36.6 32.9

All figures are defined on a per capita basis, rather than per household.
The employment characteristics of heads of households show little variation; most are self-employed cultivators. The one definition of poverty that shows some variation is that given by agricultural land per capita. The percentage of people who live in households whose head works for the government or for the private sector is much larger for this definition, and the figure for agricultural employment is noticeably smaller. While one hopes that this definition would select households whose poverty is due to lack of land, it appears to pick relatively well-off households who happen not to work in agriculture. Note also that the adult education definition of poverty chooses as poor those households whose mean adjusted per capita expenditures are nearly as high as the average for all rural households.

The different definitions generate a fair amount of variation regarding the regions in which the poor reside. One important example of this is the food consumption definition, which finds a smaller percentage of the poor in the Savannah than do the other poverty definitions. The Savannah population as a whole devotes an unusually large proportion of total expenditure to food (see Glewwe, 1987a), so that when consumption of non-food items is ignored, they appear to be better off.

In Côte d'Ivoire, cocoa and coffee are the major export crops. They are strongly affected by government policies and are grown by a substantial number of rural households, as seen in the last three rows of the first column. Using the adjusted per capita expenditure definition, 44.3 percent of the poor in rural areas cultivate cocoa or coffee trees, compared with 65.1 percent of the rural population as a whole. In contrast, the per capita food expenditure definition overestimates coffee and cocoa cultivation among the poor (it chooses fewer poor households from the Savannah, where the climate is
unsuited for these crops) while the per capita agricultural land definition severely underestimates it. These biases could lead policy-makers to erroneous conclusions regarding the effect of cocoa and coffee policies on the poor.

To summarize, one again finds that different definitions of poverty identify people with very different characteristics as being poor. The land per capita definition can be highly misleading. Even the definition based on food consumption per capita can be biased, as seen in its propensity to underestimate the number of poor who live in the Savannah.
IV. POVERTY IDENTIFICATION FOR POLICY FORMULATION

The overwhelming evidence of Section III is that different definitions of poverty indeed identify different groups of people as poor. Only per capita consumption and, to a lesser extent, per capita food consumption were strongly correlated with adjusted per capita consumption. In addition, characteristic profiles of the poor vary widely across different definitions of poverty. The formulation and implementation of policies aimed at alleviating poverty depend heavily on the regional distribution of the poor, their employment activities, and other socioeconomic characteristics. A question arises as to what information one should gather to assist the poor and assess the effectiveness of anti-poverty policies. To answer this question it is useful to classify policies according to how they are intended to reduce poverty.

Three Types of Policies and Their Information Requirements

Poverty alleviation policies can be divided into three types. First, direct transfers can be provided to households that are identified as poor or likely to be poor. Examples of this are monetary welfare payments and rations of food and non-food items. Second, relative prices, including wage rates, can be altered in ways that raise the real incomes of the poor. Price subsidies for staple foods, increased prices for crops grown by the poor, and provision of agricultural inputs at low prices are examples of such policies. Third, policies may provide the poor with opportunities to change their income-earning capabilities. Examples of this are improving the quality of and access to educational facilities, establishing job training programs, promoting new agricultural techniques, and improving access to credit.
Although the explicit goal of all three types of policies is to reduce poverty, the last two policies are likely to benefit many non-poor as well. Given that funding for such programs is limited, steps must be taken to target benefits toward the poor. It is useful to distinguish between two types of targeting. Direct targeting explicitly identifies individual households as poor or non-poor and directly provides benefits to the former group and/or withholds them from the latter. This is done by obtaining specific information on the economic status of all potentially eligible households, usually from the households themselves. Means-tested transfer policies are an obvious example of direct targeting.

Characteristic targeting seeks to channel benefits to the poor by making use of general information on their characteristics. There is never any explicit identification of individual households as eligible or ineligible for benefits based on specific information on their economic status. In practice, a combination of both targeting measures may be used (see for instance the Tamil Nadu example below).

The distinction between direct targeting and characteristic targeting is important because they have different information requirements. To target a program on the basis of household characteristics requires only a detailed characteristic profile of the poor. This can be provided by a well-planned household survey. On the other hand, direct identification of the poor requires information on the economic status of all potentially poor households to screen them for eligibility. This presents difficulties because this information often comes from the households themselves, and they have a strong incentive to present themselves as poor in order to obtain program benefits.
It is useful to evaluate the three types of poverty-reducing policies according to the extent to which they rely on direct or indirect targeting. Direct transfer programs are often proposed under the assumption that the poor will be explicitly identified as such (screened), which implies direct targeting. In contrast, the changing of relative prices targets benefits to the poor on the basis of household or individual characteristics, such as consumption patterns or the crops they cultivate. Finally, policies that attempt to change the characteristics of the poor often involve both types of targeting. The next subsection will discuss the advantages and disadvantages of all three types of policies with particular attention given to the problem of targeting.

**Advantages and Disadvantages**

1. **Direct transfers.** Many transfer policy proposals explicitly require direct targeting. In theory, such policies offer one great advantage - the benefits of the program go to all of the poor and only to the poor. But in practice there are many difficulties in direct targeting.

   One disadvantage of direct targeting is that collection of even a modest amount of data from each potentially eligible household can be very expensive. The costs of censuses in developing countries are a good example of this. Furthermore, listings of poor and non-poor households may soon become outdated as the economic and social conditions of both the poor and the population as a whole change over time. Even more important, the small amount of data gathered from each household may not be enough to identify the poor with a reasonable amount of accuracy. As was seen in Section III, alternative
("shortcut") definitions of poverty are often subject to large margins of error in identifying the poor when compared to more comprehensive measures.

The most troublesome disadvantage of direct targeting is that there may be opportunities for people who are not poor to obtain assistance by providing false information. An example of this is found in Sri Lanka, where a general food rationing scheme was modified in 1978 so that only poor households, defined in terms of monthly incomes, were eligible. Eligibility was determined according to self-declared income by households applying to receive rations.\(^{14/}\) Because misrepresentation of incomes was very easy (except for the relatively poor estate workers whose wage incomes could be checked), many of the people who obtained rations were not poor at all (see Freeman, 1981, and Edirisinghe, 1987). The problem was further compounded as people's levels of welfare changed over time and eligibility roles were not updated.

One way to reduce the leakage problem is to combine both types of targeting. An example in the area of nutrition is found in Tamil Nadu, India, where the six districts with the lowest caloric intake were included in a child feeding program (characteristic targeting). Once a child's weight rose to an adequate level they were taken off the program (direct targeting).\(^{15/}\)

2. Changing relative prices. Changing relative prices and wages to benefit the poor is a common strategy for reducing poverty. A characteristic profile of the poor can be used to see which price changes are most favorable

\(^{14/}\) In 1979 the rice ration scheme was replaced by a food stamp scheme with the same eligibility requirements.

\(^{15/}\) See Berg (1987). Note that this program was designed to reduce malnutrition, which is correlated with poverty but not identical to it.
to them. For example, if the poor are net producers of particular crops for the market, price increases for those crops would raise their incomes. These policies have the advantage that direct targeting of poor households is not required, but there are also several disadvantages.

First, changing relative prices could entail significant leakage — many of the poor may be missed, and some of the benefits may go to the non-poor. This could be reduced by subsidizing items only in regions of the country where poverty is most acute. Second, changing relative prices often entails large government costs. Reducing the price of an item requires either increased subsidy costs or lost revenues (from previously taxed goods). Several countries have used large proportions of government revenue for this purpose, such as Sri Lanka, Morocco, and Egypt.

Third, a more general problem is that changing relative prices away from their market levels entails some efficiency costs. For example, reducing the price of any good will raise consumption of that good at a price below its production cost. Yet it may be the case that equity considerations outweigh this disadvantage. Also, in many countries, price distortions may already exist, and correcting such distortions for reasons of efficiency may be consistent with changing relative prices to aid the poor (cf. Addison and Demery, 1987). A good study of Egypt's complex system of food rations and

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16/ An intriguing exception to this is offering low-wage employment for the poor. Implicit self-selection occurs, since only those with low wages have an incentive to participate.

17/ In 1978, rice rations and food stamps amounted to about 20 per cent of government revenues in Sri Lanka (Central Bank of Ceylon, 1979). In Egypt in the late 1970s the corresponding number was about 15 percent (Alderman and van Braun, 1984). For Morocco it is 11 percent (Laraki, 1988).
price subsidies is found in Alderman and von Braun (1984). They find that even though the Egyptian system is generally more favorable to the poor than the rich, many components favor the rich.

3. Changing the characteristics of the poor. The incomes of poor households depend heavily on characteristics such as the physical assets owned, the educational level of household members, the agricultural practices used, and access to credit. One of the most important of these characteristics is educational background, not only formal schooling but training in both agricultural and non-agricultural skills. Survey data can be used to examine the effects of various types of education on household incomes, so that opportunities for the poor to obtain useful skills can be expanded.

There are several advantages to policies aimed at changing the characteristics of the poor. First, direct targeting is not required, though one could try to prevent relatively wealthy households from participating in a program. Second, policies that succeed in changing the characteristics of the poor are in large part removing the causes of poverty, not just reversing its effects. Third, many of these policies may be less costly in the long run since they aim to raise the productivity of poor households.

Yet there also shortcomings. First, many characteristics can only be changed slowly over time, so that poverty is at best reduced gradually over several years. Second, some poor households, such as elderly people with few assets, may possess few characteristics that can be easily changed. Third, there may be a large amount of leakage, since policies can change the characteristics of the non-poor as well as the poor. Yet raising the productivity of the non-poor is not necessarily a waste of government
revenues. Finally, accurate identification of the key characteristics of the poor, and feasible policies that could change them, require competent and timely research. This research could prove to be a constraint in many countries.

To summarize this section, policies to assist the poor can be divided into three types: those that involve direct transfers, those that change relative prices, and those that attempt to change the characteristics of the poor. All three require accurate information to successfully target their benefits toward the poor. Data from household surveys can be used to create a characteristic profile of the poor to serve as a basis for characteristic targeting. The data can also be used to analyze the determinants of poverty, which is helpful in formulating policies to remove poverty's causes. Direct targeting can play an important role if accurate information can be obtained on the economic characteristics of individual households. A comprehensive strategy should include all three types of policies and both types of targeting, but the form any strategy would take depends on country-specific characteristics. In the next section we examine the CILSS data to provide examples of how survey data can be used to formulate policies to reduce poverty.
V. POLICIES TO REDUCE POVERTY: THE CASE OF COTE D'IVOIRE

A thorough examination of the Côte d'Ivoire data for the purpose of constructing a comprehensive set of policies to reduce poverty is beyond the scope of this paper. We present only a few examples that demonstrate the use of household survey data for policy formulation. After a brief overview of the characteristics of the poorest 30 percent of the population, several policies are proposed to reduce poverty in Côte d'Ivoire. These examples include all three types of poverty-reducing policies discussed in Section IV.

Characteristic Profile of the Poor

The profile presented here concentrates on those characteristics most relevant for choosing policies to reduce poverty.18/ Perhaps the most basic characteristic of the poor is where they live. The data in Table 6 divide the poor into two urban (Abidjan, Other Urban Areas) and three rural (East Forest, West Forest and Savannah) groups. Almost all the poor (85.7 percent) live in rural areas, and three-fourths (74.5 percent) are found in the East Forest and Savannah rural areas. Clearly, any policy to reduce poverty in Côte d'Ivoire must focus on rural areas. Further, most of the non-poor (52.8 percent) live in urban areas, while only 30.4 percent live in the East Forest or the Savannah. Thus, there is some geographic separation of the poor from the non-poor.

18/ Detailed profiles are in Glewwe (1987a) and Glewwe and De Tray (1987).
TABLE 6: Location of the Poorest 30% by Region

<table>
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<th>Region</th>
<th>Poor</th>
<th>Non-Poor</th>
<th>Total</th>
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<tr>
<td>Abidjan</td>
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<tr>
<td>Other Urban</td>
<td>3.2</td>
<td>19.3</td>
<td>22.4</td>
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<td>West Forest</td>
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<td>15.2</td>
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<td>East Forest</td>
<td>10.3</td>
<td>14.4</td>
<td>24.7</td>
</tr>
<tr>
<td>Savannah</td>
<td>12.0</td>
<td>6.9</td>
<td>18.9</td>
</tr>
<tr>
<td>Total</td>
<td>30.0</td>
<td>70.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Employment data are crucial for understanding poverty since poverty is essentially a matter of low income. Table 7 presents data on the employer and the occupation of heads of households for both poor and non-poor households. Virtually all the heads of poor households (95.1 percent) are self-employed, and the great majority (87.5 percent) work in agriculture. This offers little scope for reducing poverty by subsidizing wage rates; one must focus on prices, particularly those of marketed crops and agricultural inputs. But a general price scheme to raise agricultural incomes could entail large leakages, since half of the heads of non-poor households (48.6 percent) also work in agriculture. Table 8 provides information on four major crops grown by the poor and non-poor. Of these, only cotton is strongly concentrated among the poor. Yet only a fifth of the poor grow cotton, which is grown only in the northern Savannah area. Cocoa, coffee, and to a lesser extent rice, are also grown by the non-poor.
### TABLE 7: Occupation and Employer of Heads of Household

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<th>Employer</th>
<th>Poor</th>
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<td>Government</td>
<td>0.5 (1.6)</td>
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<td>11.4</td>
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<tr>
<td>Parastatal</td>
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<td>1.3</td>
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<tr>
<td>Private</td>
<td>1.0 (3.2)</td>
<td>11.5 (16.4)</td>
<td>12.5</td>
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<td>Self-Employed</td>
<td>28.5 (95.1)</td>
<td>45.3 (64.7)</td>
<td>73.8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>30.0 (100.0)</td>
<td>70.0 (100.0)</td>
<td>100.0</td>
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<table>
<thead>
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<th>Occupation</th>
<th>Poor</th>
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<th>Total</th>
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<td>None</td>
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<td>0.9 (1.3)</td>
<td>0.9</td>
</tr>
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<td>Agricultural</td>
<td>26.3 (87.5)</td>
<td>34.0 (48.6)</td>
<td>60.3</td>
</tr>
<tr>
<td>Sales/Services</td>
<td>2.3 (7.8)</td>
<td>18.1 (25.9)</td>
<td>20.5</td>
</tr>
<tr>
<td>Production/Const.</td>
<td>0.7 (2.3)</td>
<td>4.1 (5.8)</td>
<td>4.7</td>
</tr>
<tr>
<td>White Collar/Mgt.</td>
<td>0.5 (1.5)</td>
<td>11.3 (16.1)</td>
<td>11.7</td>
</tr>
<tr>
<td>Other</td>
<td>0.3 (0.9)</td>
<td>0.7 (2.3)</td>
<td>1.9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>30.0 (100.0)</td>
<td>70.0 (100.0)</td>
<td>100.0</td>
</tr>
</tbody>
</table>

### TABLE 8: Major Crops Grown by the Poor and the Non-Poor

<table>
<thead>
<tr>
<th>Crop</th>
<th>Poor</th>
<th>Non-Poor</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cocoa</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Who Grow</td>
<td>34.2</td>
<td>26.9</td>
<td>34.4</td>
</tr>
<tr>
<td>Hectares/Capita</td>
<td>0.33</td>
<td>0.56</td>
<td>0.49</td>
</tr>
<tr>
<td><strong>Coffee</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Who Grow</td>
<td>41.4</td>
<td>35.8</td>
<td>37.5</td>
</tr>
<tr>
<td>Hectares/Capita</td>
<td>0.38</td>
<td>0.49</td>
<td>0.45</td>
</tr>
<tr>
<td><strong>Cotton</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Who Grow</td>
<td>19.8</td>
<td>3.9</td>
<td>8.7</td>
</tr>
<tr>
<td>Hectares/Capita</td>
<td>0.18</td>
<td>0.29</td>
<td>0.21</td>
</tr>
<tr>
<td><strong>Rice</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Who Grow</td>
<td>42.3</td>
<td>26.9</td>
<td>31.6</td>
</tr>
<tr>
<td>Hectares/Capita</td>
<td>0.14</td>
<td>0.20</td>
<td>0.18</td>
</tr>
</tbody>
</table>
Another problem related to poverty is poor health, which is endemic in most African countries. Côte d'Ivoire is no exception. (See Table 9). Among the poor in Côte d'Ivoire, 5.1 percent of the potential labor force (labor force plus those not working due to illness) do not work because of poor health. In addition, another 18.8 percent report that an illness or injury has restricted their activity in the last four weeks. Thus, while poor health is often viewed as a consequence of poverty, it may also cause it by restricting income-earning activities. Note that Table 9 gives the misleading impression that the poor are more healthy than the rich. This is hard to accept, given that life expectancy in the poorest region (Savannah) was only 39 years in 1979, while it was 56 in Abidjan (Dor and van der Gaag, 1987). It appears that when the poor are ill, they tend to continue working, while the non-poor may stop. Thus, the productivity of those poor who work is reduced because they continue working even when they are ill.

One final characteristic of the Ivorian economy relevant to the poor is the impact of education on incomes. Van der Gaag and Vijverberg (1987) find strong returns to education among wage earners. Glewe (1987b) finds that education is strongly correlated with household welfare levels in urban areas, but has little impact in rural areas. Low returns in rural areas do not imply low returns to education, since educated people in rural areas can reap returns by moving to the cities, which appears common (cf. World Bank, 1987a). The characteristic profile given in this subsection can be used to formulate policies for aiding the poor. This is done in the next subsection.
TABLE 9: Poor Health and Labor Force Participation

<table>
<thead>
<tr>
<th></th>
<th>Poor Health and Labor Force Participation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A. Population Not Working Due to Illness/injury (% of Potential Labor Force)</td>
</tr>
<tr>
<td></td>
<td>All Côte d'Ivoire</td>
</tr>
<tr>
<td>Poor</td>
<td>5.1</td>
</tr>
<tr>
<td>Non-Poor</td>
<td>6.7</td>
</tr>
<tr>
<td>All</td>
<td>6.1</td>
</tr>
<tr>
<td></td>
<td>B. Working Population with Reduced Activities Past 4 Weeks (% Potential Labor Force)</td>
</tr>
<tr>
<td>Poor</td>
<td>18.8</td>
</tr>
<tr>
<td>Non-Poor</td>
<td>22.0</td>
</tr>
<tr>
<td>All</td>
<td>20.8</td>
</tr>
</tbody>
</table>

Note: Potential Labor Force includes total labor force plus those who did not work because of poor health.

Suggested Policies to Reduce Poverty

The information discussed in the previous subsection suggests some avenues for eliminating poverty in Côte d'Ivoire. As already pointed out, the suggestions in this paper are not comprehensive, but merely illustrate how survey data can be used to formulate policies to reduce poverty. Another important aspect that will not be discussed here is the financing of such policies. Financing is extremely important, but such a discussion would require a separate paper in itself. A good analysis of the issues involved in financing the provision of medical care can be found in Gertler, et al (1987). A comprehensive discussion of taxation policy is given in Newbery and Stern (1987).
The previous section criticized direct transfer policies because of the cost of gathering information and the difficulty in accurately identifying the poor. Yet in Côte d'Ivoire there is scope for direct transfers based on geographic residence. Specifically, most of the poor live in the Savannah and East Forest regions. If everyone in those regions received an income transfer, three-fourths of the poor would benefit, and leakage would go to about 30 percent of the non-poor. The leakage could be reduced by prohibiting transfers to people whose incomes are known to be high, such as well-paid government workers.19/

Policies that reduce poverty via relative prices must concentrate on agricultural prices, because the great majority of the poor work in agriculture. Of the major crops grown in Côte d'Ivoire, cotton is grown almost exclusively by the poor. Raising the price of cotton would aid about 20 percent of the poor and only 4 percent of the non-poor, thus reducing poverty without much leakage. Rice is also produced more often by the poor than by the non-poor. If the price of rice is raised along with that of cotton, nearly half of the poor (49.0 percent) would be aided (since they grow either rice or cotton), while leakage would be limited to 28.8 percent of the non-poor. Of course, some of the poor would be adversely affected by increased rice prices, since 8.1 percent of the budget of the poor is spent on rice. More than half of this is consumption of own product, however. About 27 percent of the poorest 30 percent of the population are net producers of

19/ Of course, regional differentiation in welfare programs may induce migration. However, overall welfare levels and employment opportunities in the targeted areas are well below those in the rest of the country, and leakage through migration is likely to be negligible.
rice, while 63 percent are net consumers (about 10 percent consume the same amount they produce). The net producers are clearly better off. The welfare of the net consumers depends on their ability to move into rice production after the change in relative prices (see Singh, Square and Strauss, 1986).

Another possibility for changing relative prices is to offer low-wage employment in rural areas, particularly in the off-season. To minimize leakage, wages should be set low enough to prevent non-poor households from participating. If the low-wage work generated public goods, such as improved transport networks, it might have high social rates of return, and the standard argument about the inefficiency of price distortions would not apply. The increased provision of public goods might well justify the funds spent, even without reference to benefits received by the poor.

As far as changing the characteristics of the poor, the promotion of primary education seems appropriate in view of the high returns to education and the fact that many children among the poor are not attending school. Only 36 percent of poor children aged 6-10 and 37 percent of those aged 11-15 were attending school\(^{20/}\) (Glewwe, 1987a). Of course, this strategy will have little effect in the short and medium term, but by addressing one of the major causes of poverty, the long term effects are likely to be sizable.

Another characteristic of the poor that needs to be addressed is their health. Note that the data in Table 9 omit the negative effects of poor health on the productivity of those who may be ill but continue to work. In rural Côte d'Ivoire, health care facilities are relatively inaccessible, so

\[20/\] These numbers are underestimates since they classify children who are on vacation as not attending school. But even if the underestimates were corrected, the attendance rates would not be much higher than 50 percent.
the poor often do not seek medical care when they are ill (Dor and van der Gaag, 1987). In addition, the quality of health facilities is low in rural areas. Broadening the coverage and quality of health care outside of Abidjan will help the poor increase their incomes.

The policy suggestions presented should be refined before they are adopted, but they are available for consideration primarily because the CILSS data exist. Such data not only suggest possible policies to reduce poverty, but can also be used to investigate whether those policies are likely to succeed.
VI. CONCLUSION

To formulate poverty-reducing policies in developing countries, poverty must be defined, the poor must be identified, and policies must be chosen that best help the poor, given available resources. Information on the socioeconomic characteristics of the poor, and on the population as a whole, is crucial. We have proposed a definition of poverty based on economic theory. Its importance is demonstrated by the fact that other commonly used definitions of poverty do not, at least in Côte d'Ivoire, identify the same people as poor. Using these other definitions may lead to serious errors in identifying the poor, and consequently in formulating policies to reduce poverty. Thus, the importance of gathering comprehensive household survey data in developing countries cannot be overemphasized.

Economic policies can aid the poor in three ways. They can provide the poor with direct assistance, they can alter prices (including wages) so that the real incomes of the poor are increased, and they can change the income-earning characteristics of the poor. The advantages and disadvantages of these three types of policies, as well as their information requirements, have been discussed. It is particularly important to note that targeting benefits on the basis of a characteristic profile of the poor requires only household survey data, while direct targeting requires a screening procedure to identify the poor on a case-by-case basis. Information from household surveys can guide policy decisions on alleviating poverty, and can also be used to monitor the progress of those policies. Data from the Côte d'Ivoire Living Standards Survey (CILSS) were used to demonstrate how survey data can suggest and evaluate policies to reduce poverty.
There is much talk about reducing poverty in developing countries, but it often seems that little is actually being done. If the appropriate information is not available, reducing poverty will be, at best, a matter of chance. Given the political will to confront poverty, one of the most important tasks is to gather accurate information on the poor, which implies organizing household surveys in developing countries. Many surveys have already been done, but there is much room for improvement. Without continued efforts to improve the quality of survey data from developing countries, it is hard to see how effective poverty-reducing policies will be put into place. The task is not an easy one, but if real efforts are made in an intelligent manner, genuine progress can be made in alleviating poverty in developing countries.

21/ The importance of household survey data for the formulation and implementation of poverty alleviation policies was explicitly recognized in the late 1970s when Robert McNamara initiated the Living Standards Measurement Study (LSMS) in the World Bank. The CILSS is the first field test of the comprehensive multi-purpose household survey developed by the LSMS.
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