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POVERTY IN MALAWI, 1998

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Abstract

This paper presents the poverty analysis of the 1997–98 Malawi Integrated Household Survey. The analysis developed basic needs poverty lines, using consumption-based measures of welfare to classify households and individuals as poor and nonpoor. Because consumption data were not of uniform quality across sample households, the analysis made adjustments to derive a more accurate assessment of the incidence of poverty across the country.

The analysis provides poverty and inequality estimates for Malawi's population. About 65 percent were unable to meet their basic needs, and poverty was deep and pervasive. The distribution of household welfare was closely examined within the context of the Malawi Poverty Reduction Strategy to guide government action in helping poor households improve their own well-being.

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1. Introduction

The Government of Malawi carried out an Integrated Household Survey (IHS) in 1997 and 1998 to better understand the conditions under which Malawians were living. This followed the government's adoption of its Poverty Alleviation Program in 1994 and the institution of a Poverty Monitoring System.

An important economic drive for all individuals is to improve one's living conditions or welfare. Likewise, an appropriate function for many governmental and nongovernmental institutions is to assist individuals who are striving to improve their welfare, particularly those unable to meet their basic living requirements. An important starting point in such governmental efforts is to understand conditions under which people live. The IHS was used to undertake a poverty analysis and, subsequently, to prepare a poverty profile of Malawians. This paper presents the results of the poverty analysis.

Poverty is that condition in which the basic needs of a household or individual are not met. In order to determine whether a household is poor, one must first establish its level of welfare. That level, whether defined subjectively or objectively, is compared to a level of welfare—a poverty line—above which one assumes that the basic needs of a household are met. Establishing the poverty line is the second step in ascertaining the poverty status of a household. The poverty analysis offered here determines the poverty status of Malawian households in a relatively objective, quantitative manner.

The definition of poverty noted above is necessarily very broad, but the working definition adopted was considerably more specific and less holistic. The analysis identified a set of daily basic food and nonfood requirements for individuals in four geographical areas of Malawi, using consumption and expenditure data from the 1997–98 IHS. Poverty lines for each area were established, using the cost in Malawi kwacha (MK) of acquiring this "basket" of basic items. The total consumption reported by a survey household was then evaluated against the poverty line. If the reported per capita total daily consumption for a household was above the poverty line in the region, the

household was considered nonpoor. The household was classified as poor if its per capita daily consumption was below this poverty line.

IHS data, methods used, and poverty and inequality measures calculated are described. The results of the analysis, including poverty and inequality measures, are presented, and their policy implications are considered in light of the Poverty Reduction Strategy Paper (PRSP) adopted by the Government of Malawi (Malawi 2002).

2. Data and Methods

The 1997–98 Malawi Integrated Household Survey

The 1997–98 IHS was a comprehensive socioeconomic survey of the living standards of households in all districts of Malawi. The Malawi National Statistical Office administered the IHS to 12,960 households between November 1997 and October 1998. The survey was in two parts. The first was a large questionnaire administered to respondent households during a single visit, which captured demographic characteristics as well as data relating to health and nutrition, education, agriculture, income sources, and consumption and expenditure. The second component was a diary of expenditure. This was to be maintained over a minimum of 14 days by literate households or by means of enumerators visiting twice a week to record expenditures of survey households between visits.

The 29 primary sampling strata comprised the 25 administrative districts of Malawi and the country's four major urban centers—Lilongwe, Blantyre, Zomba, and Mzuzu. In rural areas, a three-stage sample selection process was used. The first stage consisted of selecting the traditional authority (TA), the subdistrict spatial unit. The selection of enumeration areas (EA) within the TA was the second stage. Roughly, one TA was selected for every 50,000 households in the stratum. Twelve EAs were selected in each of the TAs. In both cases, the probability of selection was proportional to population size. The third stage was the random selection of 20 households within each EA. These 20 households were interviewed the same month. To capture seasonal

variation, interviewing was carried out in turn in each EA through 12 months of the survey year.

In the four urban areas, a two-stage sample selection procedure was employed. Again, EAs within a city were selected with probability of selection proportional to population size. Within each EA, 10 households were randomly selected; all were interviewed the same month.

Data were cleaned from May 1999 to April 2000. When released, the data set consisted of 10,698 households. However, the diary of expenditure had not been consistently maintained by enumerators across the country: only 6,586 households were judged to have reliable expenditure and consumption information. Table 1 presents these IHS samples, disaggregated by region and rural and urban areas.

Table 1—Distribution of Integrated Household Survey sample and analytical data sets relating to 10,698 households and 6,586 data set, by region and rural and urban areas

	Traditional authorities			Enumeration areas			Survey households			Estimated household population
	Sample	10,698	6,586	Sample	10,698	6,586	Sample	10,698	6,586	(1997-98)
Malawi	48	47	45	720	614	538	12,960	10,698	6,586	2,242,605
Southern region	24	23	23	372	307	269	6,600	5,215	3,046	1,084,852
Central region	18	18	16	252	221	191	4,680	4,018	2,608	907,922
Northern region	6	6	6	96	86	78	1,680	1,465	932	249,831
Rural	48	47	45	576	470	396	11,520	9,280	5,657	2,001,573
Urban	-	-	-	144	144	142	1,440	1,418	929	241,032

Poverty Analysis

Welfare Measure

The measure of welfare for a household used is the *total daily per capita consumption and expenditure* that a household reported. This measure is expressed in MK deflated to April 1998 values, which was the midpoint of the survey period.

Using income is an alternative approach in developing a household welfare measure. However, consumption and expenditure information is more suitable for several reasons:

- Income is lumpy in agricultural economies such as Malawi's. Farming households receive large amounts of cash after the harvest and very little during the rest of the year. Expenditure is a smoother measure of welfare over time because households are constantly spending income and consuming.
- Consumption and expenditure can be viewed as realized welfare. Income is more a measure of potential welfare.
- Data on expenditures are generally more reliable and stable than income data. Often, households are more willing to truthfully report consumption and expenditures than their incomes.
- In Malawi, much income is derived from self-employed business or subsistence-oriented agricultural production. Assigning income values to the proceeds of these enterprises is often problematic (Hentschel and Lanjouw 1996).

The household welfare measure is made up of four components:

1. Total food consumption
   - All food consumption reported by the household, whether purchased or acquired from own production, was normalized to a cash value of daily consumption of individual food items.

2. Total expenses for nonfood, nondurable goods
   - Similar to food items, a daily value in MK was determined for all nonfood, nondurable goods consumed by the household. Gifts to others outside the household—outgoing income transfers—were included in this component.

3. Estimated use-value of durable consumer goods.
   - The use-value of items such as vehicles, furniture, and appliances was computed by deriving an imputed daily rental rate. This took into account the rate of depreciation for an item (the inverse of its estimated life span), the opportunity cost of the capital locked up in the durable good (bank savings

interest rate used as a proxy), and the replacement cost of the durable good. The formula used was

$$Use\text{-}value\ of\ item = current\ replacement\ value\left(\frac{rate\ of\ interest + depreciation\ rate\ for\ item}{1 - depreciation\ rate\ for\ item}\right).$$

4. Actual or imputed rental value of housing for the household.

The sum of all reported expenditure on and consumption of these items on a per capita basis constituted the welfare indicator for a household.

Using per capita consumption as the basis of the household welfare indicator rather than an adult equivalent basis was an important analytical choice. The per capita basis involves several debatable assumptions, including that everyone in the household, irrespective of age or gender, has the same level and types of needs. The per capita basis also assumes that everyone in the household receives equal allocations of consumption items, and that consumption levels per person for those living together are the same as they would have been if each person lived separately (Skoufias, Davis, and Behrman 1999, 77).

In contrast, an adult equivalent basis normalizes consumption by taking into account the household's age and gender composition. While doing so is justified when considering food consumption, consumption of nonfood items is not very closely linked—if at all—to an individual's age and gender. Neither approach is perfect. The per capita basis for the welfare indicator was used to be consistent with standard practice and in the interests of simplicity.

Poverty Line Derivation

The *poverty line*—that level of welfare that distinguishes poor households from nonpoor households—is expressed in the same unit as the consumption-based measure of welfare. The cost-of-basic-needs method was used in the Malawi IHS (MPF/EMU/IFPRI

1998; Ravallion 1998, 15–20). In brief, the following steps were taken to derive the poverty line.

1. The objective core of the poverty line was the per capita recommended daily calorie requirement (RDR)—objectively established by nutrition researchers—for the households in the data set. This calorie requirement was used to establish the *food* component of the poverty line—the food poverty line—by determining what it cost poorer households in Malawi to acquire sufficient calories to meet their daily requirements.
2. Unfortunately, no independent objective criteria existed to establish the *nonfood* component of the poverty line—the nonfood poverty line. The method adopted was to examine the daily nonfood consumption of households whose *total* consumption was valued in the neighborhood of the value of the *food* poverty line. Since these households were sacrificing nutritionally necessary consumption to consume these nonfood items, they could be considered as basic necessities for the household.
3. The poverty line resulted from summing the food and the nonfood components. Each household's poverty status was then assessed by comparing the level of its welfare indicator to the poverty line.

Poverty lines were constructed for four areas of the country—southern rural, central rural, northern rural, and urban. These were established so that each poverty line reflected differences in tastes, consumption preferences, demographic makeup of households, and prices. The three rural poverty line areas corresponded to the administrative regions of the country and included district administrative centers. These regional areas did not include the four urban centers of Blantyre, Zomba, Lilongwe, and Mzuzu, which made up the urban poverty line area.

Daily calorie requirements. RDRs have been established for individuals in eastern, central, and southern Africa by the World Health Organization (CTA/ECSA

1987). These calorie requirements are differentiated by age, sex, workload, and whether a woman is pregnant or breastfeeding. Based on age and sex, each individual in the IHS data set was assigned an RDR. The moderate activity-level requirement was used for all adults.

Because the IHS contained no information on whether women were pregnant, the additional calories required during the last trimester of pregnancy could not be taken into account. However, the lactation requirement was included by assuming that all infants less than 1 year of age were breastfeeding.

Based on the 6,586 household data set, the mean daily per capita calorie requirement for Malawi's population data set was determined to be 2,198 calories.

Deriving the food poverty line. To derive the food poverty line, the value of each calorie that *poorer* households reported consuming needed to be determined. Poorer households were featured on the assumption that they acquired their calories as cheaply as possible, given local taste preferences. Wealthier households usually spend more for the food and calories they consume.

Poorer households were defined as those whose reported calorie consumption was less than their RDR. On this basis, just over 66 percent of the households in the IHS data set were selected.

To derive the cost per calorie for each poorer household, the reported daily per capita calorie consumption was divided by the total food consumption component of the welfare indicator. The weighted median cost per calorie for poorer households in each poverty line area was used as the cost per calorie. Table 2 shows the basket of food items that the data set's poorer households reported consuming. These made up the food poverty line for each poverty line area.

The food poverty line for all households in a region was the product of the price per calorie and the RDR for the region's poorer households. The RDR for poorer households was used so that the food poverty line reflected prevailing demographic conditions and calorie needs of poorer households. The calorie requirement used was the

weighted median per capita RDR for the region's poorer households. Table 3 shows food poverty lines and their components for each area.

Table 2—Reference food bundles for poverty lines: Proportion of cash and calorie value of all food consumed by poorer households, by food groups and poverty line areas

	Southern rural		Central rural		Northern rural		Urban		All poorer households	
	Cash value	Calorie value	Cash value	Calorie value	Cash value	Calorie value	Cash value	Calorie value	Cash value	Calorie value
Cereals (%)	46.7	80.8	46.3	71.3	39.9	63.7	22.3	50.4	40.8	72.2
Roots and tubers (%)	1.4	1.4	2.7	4.5	3.6	5.4	3.1	5.3	2.4	3.4
Sugar, sugar products (%)	4.7	5.4	3.1	4.2	4.7	6.3	8.2	18.4	4.8	6.5
Pulses and nuts (%)	5.0	4.0	10.2	12.2	11.5	14.0	4.4	5.0	7.4	8.3
Vegetables (%)	13.1	1.8	14.7	2.8	12.1	3.7	12.5	3.0	13.4	2.5
Fruits (%)	8.3	1.9	6.5	1.4	7.1	2.0	2.5	1.6	6.3	1.7
Meat (%)	7.3	1.1	8.2	1.5	10.0	1.7	17.0	4.4	9.9	1.7
Eggs (%)	8.7	2.2	4.5	1.1	3.4	1.1	10.6	2.0	7.0	1.7
Fish (%)	0.3	0.0	0.2	0.0	0.2	0.0	2.2	0.4	0.6	0.1
Milk or milk products (%)	0.4	0.1	0.4	0.1	1.3	0.3	3.5	1.3	1.1	0.2
Cooking oil and fats (%)	1.5	0.8	0.9	0.5	2.0	1.3	6.9	7.1	2.5	1.5
Other food items (%)	1.8	0.2	1.4	0.1	1.7	0.0	2.3	0.3	1.7	0.1
Beverages (%)	0.4	0.0	0.4	0.0	0.6	0.1	2.8	0.5	0.9	0.1
Alcohol (%)	0.6	0.1	0.7	0.1	2.0	0.4	1.7	0.3	1.0	0.1
Mean per capita value of food consumed daily	MK4.39	1,235	MK5.57	1,323	MK5.84	1,305	MK10.42	1,232	MK5.65	1,273
Median per capita value of food consumed daily	MK3.96	1,227	MK4.98	1,307	MK5.72	1,359	MK9.91	1,179	MK4.91	1,262
IHS households	1,669		1,478		514		695		4,356	

Table 3—Median per capita recommended daily calorie intake requirements (RDR) for calories and median price per calorie for poorer households and food poverty lines, by poverty line area (April 1998 prices)

Poverty line region	Per capita calorie RDR	Cost per 1,000 calories	Food poverty line (MK/person/day)
Southern rural	2,167	3.01	6.53
Central rural	2,140	3.62	7.76
Northern rural	2,179	4.08	8.90
Urban	2,250	7.53	16.95

Deriving the nonfood poverty line. To derive the nonfood component of the poverty line, the value of the nonfood consumption was used only for households whose *total* consumption and expenditure—the household welfare indicator—was in the *neighborhood* of the *food* poverty line. This was done on the assumption that the

nonfood consumption of these households reflected the minimum amount necessary. Because they chose to consume nonfood goods when they needed additional food consumption, these nonfood items were seen as important to their welfare.

The neighborhood of the food poverty line was defined as households whose total consumption was within 10 percent on either side of the food poverty line. A triangular, analytical weighting scheme was used to calculate the value of the nonfood poverty line. This gave greater weight to the nonfood consumption of households whose consumption was closer to the food poverty line.

Poverty lines. Table 4 presents the poverty lines and their food and nonfood components and the proportion made up by food consumption. It shows that food constituted a large proportion of rural consumption. Rural poverty lines were between MK 7.76 and MK 11.16 per person per day, while the urban poverty line was over twice that, at MK 25.38.

Table 4—Poverty, food poverty, nonfood poverty, and ultra-poverty lines and spatial price indices at April 1998 prices, by poverty line area

	Poverty line	Food	Nonfood	Ultra	Food share of poverty line	Spatial price index[a]
	(MK)	(MK)	(MK)	(MK)	(%)	
Southern rural	7.76	6.53	1.23	4.65	84.1	74.1
Central rural	9.27	7.76	1.51	5.56	83.7	92.3
Northern rural	11.16	8.90	2.26	6.69	79.7	112.4
Urban	25.38	16.95	8.43	15.23	66.8	222.1
National weighted average poverty line	10.47	-	-	-	-	100.0

Note: April 1998 MK 25.40 = US$1.

[a] Spatial price differences are revealed by different poverty lines in each region. The poverty lines represent different prices across the country for a comparable basket of goods necessary to meet the daily basic needs of an individual in Malawi. The spatial price index uses the weighted average poverty line (6,586 household data set) as a base. It is calculated as: 100 * total poverty line ÷ national weighted average poverty line.

On any given day, most rural Malawians spend far less than the poverty lines indicate. However, they are not necessarily poor. The welfare indicator included

elements that were not monetized—noncash food consumption, noncash nonfood consumption, the use-value of durable items, and the imputed house rental value for household living in houses they own. Table 5 disaggregates into cash, noncash, and mixed cash and noncash the total consumption of IHS sample households close to the poverty line. For rural households, close to 60 percent of daily consumption did not involve a cash transaction. Production for home consumption is a very important aspect of the household economy in rural Malawi.

Table 5—Level of monetization of total consumption for households whose total consumption is close to the poverty line, by poverty line area

	Southern rural	Central rural	Northern rural	Urban	All
Noncash expenditure and consumption (%)	53.3	65.0	60.2	6.8	47.9
Cash expenditure and consumption (%)	41.1	31.6	37.0	78.3	45.5
Mixed cash and noncash (%)	5.6	3.4	2.8	14.9	6.6
Poverty line (MK)	7.76	9.27	11.16	25.38	-
Number of households in sample subset	285	305	101	103	794
Number of individuals in sample subset	1,168	1,426	416	412	3,422

The ultra-poverty line. The ultra poor were defined as those whose total consumption was less than 60 percent of the poverty line. It was useful to differentiate between the poor and ultra poor, as knowing the characteristics and the location of the most destitute allows poverty alleviation programs to target their restricted resources more effectively. Table 4 presents the ultra-poverty line alongside other poverty lines in the four areas.

Deriving a Proxy Welfare Indicator for Dropped Households

In the final cleaned IHS data set of 10,698 households, 4,112 did not have good quality consumption and expenditure information. Data from 6,586 IHS households were used to calculate poverty lines.

Assessment of bias in dropping households from analysis. An important consideration in dropping 4,112 households from the initial analysis was whether their

levels of welfare were significantly different from those retained. If the dropped households were not significantly different, very little would be lost. However, if they were significantly poorer or less poor than the 6,586 households used, considerable bias might be introduced into inferences made on the welfare conditions of Malawi's population as a whole.

To make this judgment, a Student's t-test was undertaken on 21 household variables to compare the means of retained households to those of dropped households. Variables chosen had a strong correlation with the poverty status of a Malawian household, including its dependency ratio and whether it was female-headed, grew hybrid maize, or owned a bicycle. An a priori judgment concerning poor and nonpoor bias was made for each variable if the mean value for the characteristic for one subset of households was significantly higher than the other. The results of the means comparison showed that dropped households were likely to be poorer than the 6,586 households retained for the analysis.

The nonpoor bias in the smaller data set had no effect on the derivation of the poverty line. It used a basic-needs approach that was anchored to the RDR of individuals in poorer sample households. Households were judged poor if they were not meeting their RDR, plus an allowance for nonfood consumption. The resultant poverty line should be consistent, whether 30, 50, or 80 percent of households in the data set have consumption levels below the poverty line derived from the analysis.

However, poverty measures derived for the nation from this nonpoor-biased data set would have been erroneous. A poverty headcount lower than its likely true incidence would have resulted if only the 6,586 households with good consumption data had been used in the analysis.

Assigning proxy welfare measures. In order to rectify the problem of bias in the 6,586 household data set, a proxy welfare measure was assigned to each of the 4,112 dropped households. This was done by undertaking a regression analysis on a range of nonconsumption characteristics of the 6,586 retained households. It used their welfare

indicator—total daily per capita consumption—as the dependent variable. The resultant model was applied to dropped households to derive a proxy welfare indicator for them.[1]

As the dropped households were somewhat poorer, the national poverty headcount based on the full 10,698 household sample was expected to be higher than one derived from the 6,586 households. This expectation was confirmed. The smaller data set indicated a weighted national poverty headcount of 59.6 percent, while the 10,698 data set, employing a proxy welfare indicator for 4,112 households, estimated the headcount at 65.3 percent, an increase of 5.7 percent. Table 6 shows by poverty line area the headcount differences for the two data sets.

Table 6—Poverty headcount, by poverty line areas

	Full data set, 10,698 households		Poverty line derivation data set, 6,586 households	
Poverty line area	Individual poverty headcount	Malawi's poor in region	Individual poverty headcount	Malawi's poor in region
	(percent)	(percent)	(percent)	(percent)
Malawi	65.3	-	59.6	-
Southern rural	68.9	43.5	62.2	43.4
Central rural	65.0	38.1	58.8	37.7
Northern rural	61.8	9.7	60.6	10.2
Urban	54.9	8.7	50.8	8.7

Poverty and Inequality Measures

Several important measures of poverty were calculated to help policymakers decide who should be targeted by poverty reduction strategies and programs.

Foster-Greer-Thorbecke Poverty Measures

Three poverty measures of the Foster-Greer-Thorbecke class were used to characterize the level of poverty in Malawi (Foster, Greer, and Thorbecke 1984).[2]

[1] A range of models were evaluated using various combinations of 143 candidate independent variables. While not described here, our preferred model uses the natural log of the welfare indicator as the dependent variable and 78 independent variables. The adjusted-R^2 for this model is 0.627.

1. Headcount index ($P0$)—This index measures the incidence of poverty—or the proportion of the population whose consumption is below the poverty line.
2. Poverty gap index ($P1$)—This is defined as the mean for the whole population of the difference between the level of consumption of an individual and the poverty line, as expressed as a proportion of the poverty line—or the poverty gap. Nonpoor households have a poverty gap of zero. This measure is superior to the headcount insofar as it indicates the depth of poverty.
3. Poverty severity index ($P2$)—This index is the mean of the squared poverty gap. As individuals in poorer households receive greater weight than less poor individuals, it provides a better measure than the other two indices of the severity of poverty.[3]

For all measures, the greater the index, the worse the poverty. Using the poverty headcount is intuitive. However, the other two indices are more useful in making comparisons between different populations. For example, in deciding whether to implement a poverty reduction program in one of two districts, all things being equal, the program should be brought to the district with the higher poverty severity index.

Poverty gap and poverty severity measures from the IHS were generated using the smaller (6,586 household) data set. If the larger data set had been used in calculating the

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[2] A two-step process is taken to calculate these measures. First, a measure of individual poverty is constructed. The formula for this is $\rho_{\alpha i} = [\max ((1 - x_i / z), 0]^{\alpha}$, where x_i is the consumption of the i^{th} person in a population of size n, z is the poverty line, and α is a nonnegative parameter.

Second, the aggregate poverty index is calculated by taking the mean of this measure across the population:

$$P_{\alpha} = \sum_{i=1}^{n} \rho_{\alpha i} / n .$$

The headcount index results when $\alpha = 0$, the poverty gap index when $\alpha = 1$, and the poverty severity index when $\alpha = 2$.

[3] The poverty severity index is sensitive to the distribution of consumption levels among the poor, whereas the other indices are not. One poor person sacrificing consumption so that a *poorer* person's consumption is enhanced will alter neither the poverty headcount nor the poverty gap index. However, this action will decrease the poverty severity index.

poverty measures, any error associated with the proxy welfare indicator estimation procedure would have been amplified.

Index of Inequality

The Gini coefficient was also used to assess poverty in Malawi. This provided an indication of the degree of inequality in consumption levels across the population. The Gini coefficient is the average of the absolute value of the differences between consumption levels for all individuals in the population relative to the mean consumption level of the population.[4]

The Gini coefficient is easier to interpret in reference to a Lorenz curve. After ranking all persons by their welfare indicator of total daily consumption, the Lorenz curve plots the cumulative percent of total consumption on the cumulative percent of population. A Lorenz curve that is a straight 45-degree diagonal represents perfect equality and a Gini coefficient of zero: everyone has exactly the same consumption level. The area between the diagonal and the actual Lorenz curve is a measure of the degree of inequality in consumption across a population. The Gini coefficient is the ratio of the area defined by the actual Lorenz curve and the diagonal and that of the area of the entire triangle underneath the diagonal. Gini coefficients were calculated using only the 6,586 household data set.

[5] The formula for the Gini coefficient is as follows, where x is consumption, μ is average consumption, and N is the sample size:

$$\frac{2}{\mu N(N-1)} \sum_i \sum_j | x_i - x_j | .$$

3. Poverty in Malawi in 1998

Poverty Measures

Poverty Headcount

Table 7 presents the average values of Malawi's daily per capita consumption, poverty headcount estimates, and the distribution of the poor by regions and in rural and urban areas. Average levels of consumption (expressed in April 1998 prices) were adjusted for spatial differences in the cost of living for poorer households across poverty line areas—southern rural, central rural, northern rural, and urban. The 10,698-household data set was used to compute poverty headcounts.

Table 7—Poverty incidence and mean consumption, by region and rural and urban areas, using 10,698 household data set

	Poverty headcount (percent of population)	Mean consumption[a]	Median consumption[a]	Absolute number of poor persons	Percent of Malawi's poor in area	Population share
	(percent)	(MK/person/day)	(MK/person/day)		(percent)	(percent)
Malawi	65.3	11.16	8.38	6,308,800	100.0	100.0
	(1.89)	(0.36)				
Southern region	68.1	10.89	8.00	3,103,500	49.2	47.1
	(2.78)	(0.57)				
Central region	62.8	11.45	8.68	2,533,500	40.2	41.8
	(3.22)	(0.55)				
Northern region	62.5	11.23	8.75	671,800	10.6	11.1
	(1.46)	(0.64)				
Rural	66.5	10.44	8.28	5,659,600	91.3	89.7
	(2.03)	(0.34)				
Urban	54.9	17.44	9.67	649,200	8.7	10.3
	(3.79)	(1.64)				

Notes: This table should be used with caution. The welfare measures for 4,112 of the 10,698 households were estimated using a proxy welfare indicator model. Standard errors are corrected for sample design, and are in parentheses under the values.

[a] Consumption values were calculated from temporarily and spatially deflated values (April 1998).

The estimates show that 65.3 percent of Malawi's population lived in poverty in 1998. The incidence of poverty was higher in rural areas than in urban areas: 66.5

percent of the rural population and 54.9 percent of the urban population lived in poverty. This difference is statistically significant.

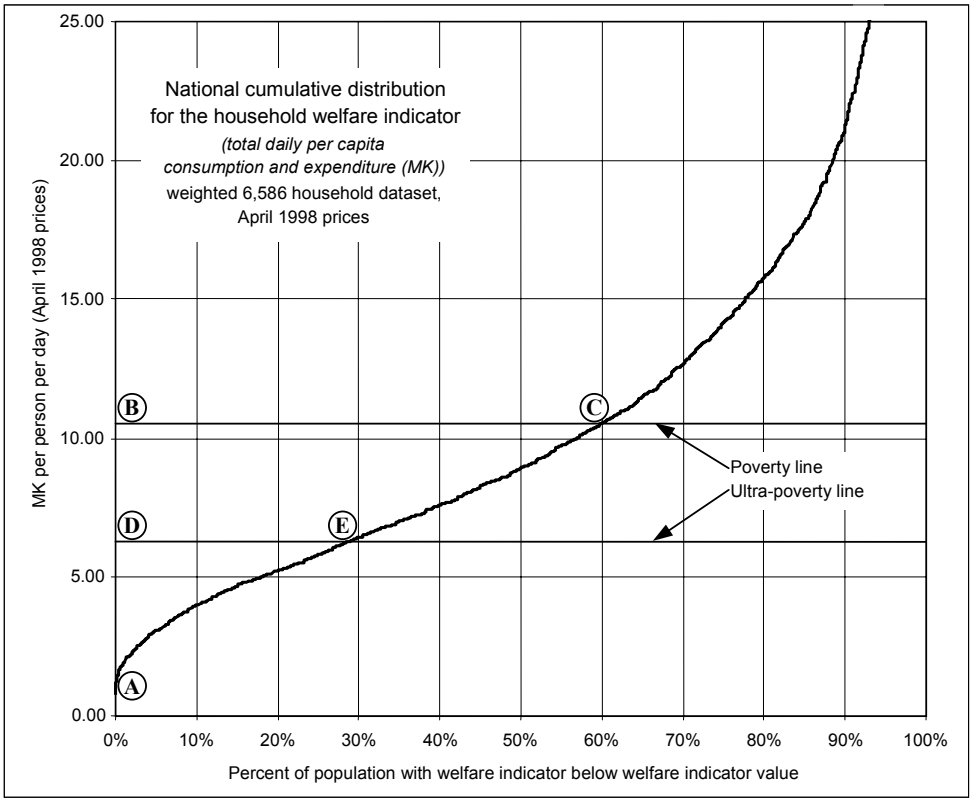
Although regional comparisons are more difficult to understand, given the confounding effect of the presence of both rural and urban households within the regions, the incidence of poverty was the highest in the southern region, followed by the central and northern regions. However, these differences in poverty headcounts across regions are not statistically significant.

The proportion of the nation's poor living in rural and urban areas or living in each region can be computed using headcount estimates and population shares. Rural areas contained 90 percent of the total population, and 91 percent of the poor lived in rural Malawi in 1998. Given that the southern region is the most populous, it comes as no surprise that the absolute number of poor people was also highest in this region. About one-half of Malawi's poor lived in the southern region, which accounted for 47 percent of the country's population. In 1998, 40 percent of the poor lived in the central region, while 11 percent lived in the northern region.

Poverty Gap and Poverty Severity

As poverty gap and poverty severity measures are based on the distance between the poverty line and the consumption level of an individual, it was deemed more appropriate to compute these measures using actual rather than estimated consumption values. Recall that the poverty headcount for Malawi based on the smaller sample was estimated at 59.6 percent—slightly (5.7 percent) lower than that derived from the analysis of the larger sample of 10,698 households. The cumulative distribution plot for household welfare for the smaller data set (weighted) is presented in Figure 1.

Figure 1—Cumulative distribution for the household welfare indicator using 6,586 household data set



The poverty gap and the squared poverty gap indices suggested poverty was deeper and more severe in rural Malawi than in the four urban centers (Table 8). These indices are also slightly higher in the southern region than in the northern or central regions.

The poverty measures used are additively decomposable, making it possible to determine the percentage contribution of any subgroup to total poverty. The analysis suggests that if the poor in the southern region were made nonpoor, the severity of poverty in Malawi would be reduced by 53.4 percent. Wholly eliminating poverty in the central and northern regions would reduce the severity of poverty nationally by 36.5 and 10.1 percent, respectively.

Table 8—Mean consumption and individual poverty measures, by region and rural and urban areas, using 6,586 household data set

	Poverty headcount (percent of population)	Poverty gap index	Poverty severity index	Mean consumption[a]	Median consumption[a]	Total poverty gap in 1998[a]	Contribution to total poverty severity[b]	Weighted population share
	(percent)			(MK/person/ day)	(MK/person/ day)	(million MK)	(percent)	(percent)
Malawi	59.6	0.2336	0.1194	12.05	8.93	8,749	100.0	100.0
	(2.55)	(0.02)	(0.01)	(0.52)				
Southern region	61.8	0.2535	0.1343	11.94	8.52	4,507	53.4	47.5
	(3.98)	(0.03)	(0.02)	(0.89)				
Central region	56.6	0.2118	0.1048	12.35	9.40	3,303	36.5	41.6
	(3.80)	(0.02)	(0.01)	(0.69)				
Northern region	61.5	0.2306	0.1107	11.38	8.70	939	10.1	10.9
	(5.02)	(0.020	(0.01)	(0.89)				
Rural	60.6	0.2385	0.1220	11.30	8.76	8,017	91.8	89.8
	(2.81)	(0.02)	(0.01)	(0.53)				
Urban	50.8	0.1913	0.0967	18.66	10.38	731	8.2	10.2
	(3.85)	(0.02)	(0.01)	(1.91)				

Notes: Standard errors are corrected for sample design, and are in parentheses under the values.

[a] Consumption values were calculated from temporarily and spatially deflated MK values (April 1998).

[b] Contribution to total poverty severity calculated as: 100 x (region population share) x (region poverty severity index / Malawi poverty severity index).

Extrapolating the poverty gap of the survey sample to the national population, the total poverty gap in Malawi (the aggregate annual consumption shortfall from the poverty lines in monetary terms) was estimated at MK 8.75 billion (US$340 million) in 1998. (This is the annual value of the area ABC in Figure 1.) This amount was equivalent to about 20 percent of the gross domestic product in that year. The southern region accounted for half of the national poverty gap.

Ultra Poverty

The poverty measures for Malawi using the ultra-poverty line are presented in Table 9. Recall that the ultra-poverty line is that level of consumption in a poverty line area that is 60 percent of the poverty line. Using the smaller IHS data set, the national ultra-poverty headcount was 28.7 percent. The southern region had a disproportionate number of the ultra poor, and rural areas had proportionately more ultra poor than urban centers did. This pattern was also reflected in the ultra-poverty gap and ultra-poverty severity indices.

Table 9—Individual ultra-poverty measures and mean consumption, by region and rural and urban areas, using 6,586 household data set

	Ultra-poverty headcount (percent of population)	Ultra-poverty gap index	Ultra-poverty severity index	Absolute number of ultra-poor persons	Percent of Malawi's ultra-poor in area	Weighted population share
	(percent)				(percent)	(percent)
Malawi	28.7	0.09	0.04	2,813,300	100.0	100.0
	(2.51)	(0.010)	(0.005)			
Southern region	31.8	0.10	0.05	1,477,800	52.5	47.5
	(3.82)	(0.016)	(0.009)			
Central region	25.3	0.07	0.03	1,032,600	36.7	41.6
	(3.81)	(0.014)	(0.007)			
Northern region	28.4	0.07	0.03	302,900	10.8	10.9
	(4.53)	(0.012)	(0.004)			
Rural	29.3	0.09	0.04	2,575,500	91.5	89.8
	(2.77)	(0.011)	(0.006)			
Urban	23.8	0.07	0.03	237,700	8.5	10.2
	(2.88)	(0.010)	(0.005)			

Note: Consumption values calculated from temporally and spatially deflated MK values (April 1998).

Inequality in Consumption

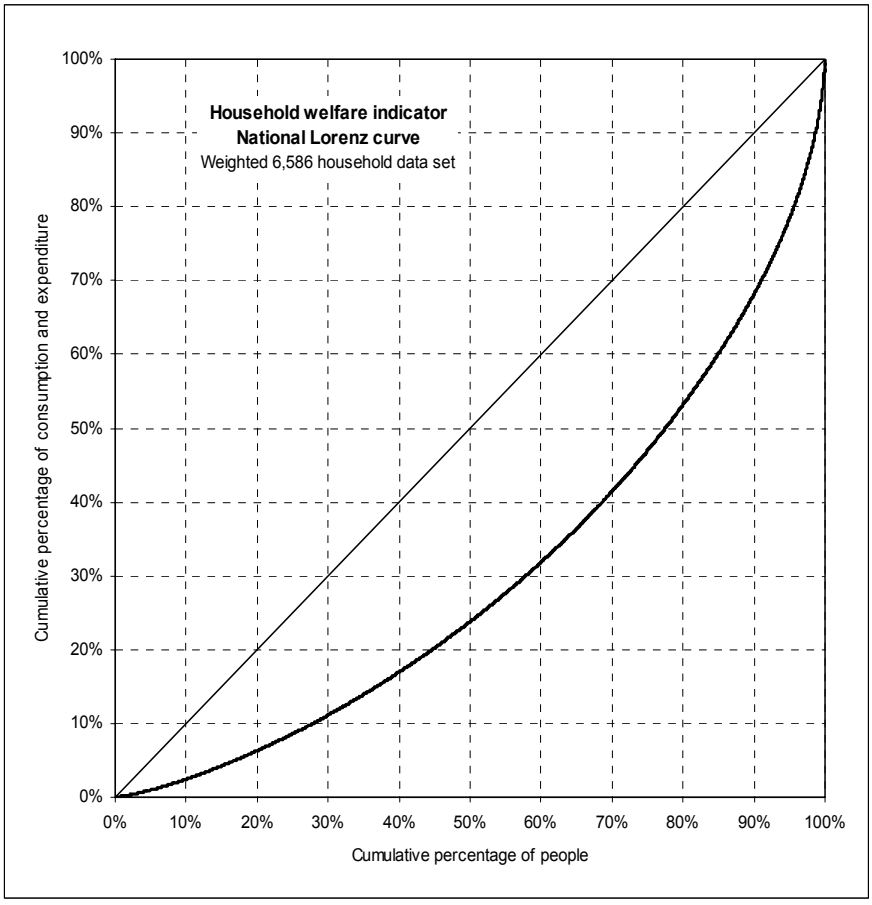
The indices of inequality in consumption by region as revealed by the Gini coefficients and related statistics are presented in Table 10. The levels of inequality are illustrated by the Lorenz curve in Figure 2. In spite of the lower incidence of poverty in urban centers, their level of inequality in consumption was considerably higher than in rural areas. The richest 20 percent of the population in rural areas accounted for 44 percent of total consumption, while the richest 20 percent in cities accounted for 58 percent of total consumption. The degree of inequality in consumption was also highest in the southern region. However, this may be a result of the south's somewhat larger urban population rather than a consistently higher level of inequality across the region.

Table 10—Indices of inequality in total daily consumption, by region, using 6,586 household data set

		Percentage of the total consumption of the population			
	Gini coefficient[a]	Consumption of the poorest 20 percent	Consumption of the richest 20 percent	Consumption of the poorest 10 percent	Consumption of the richest 10 percent
Malawi	0.401	6.3	46.8	2.5	31.8
Southern region	0.423	5.9	48.7	2.2	34.0
Central region	0.383	6.6	45.4	2.6	30.3
Northern region	0.362	7.4	44.2	3.1	28.8
Rural	0.374	6.7	44.3	2.6	29.0
Urban	0.520	4.5	58.4	1.7	42.9

[a] The Gini coefficient provides an indication of how equitable the distribution is across the population. A Gini coefficient of zero results if all households have the same level of consumption and expenditure—perfect equity. A coefficient of one results from a situation where all except one member of the population have no consumption and expenditure.

Figure 2—Lorenz curve for total per capita daily consumption



Comparison to Earlier Poverty Lines and Headcounts

In the past, several poverty lines and estimates of poverty for Malawi have been generated. Table 11 sketches out the basis for these lines, together with the poverty headcounts generated. Past national poverty headcounts were somewhat smaller than reported in this study. However, we argue that this does not provide conclusive evidence that trends in poverty incidence are worsening. The methods employed to derive earlier poverty estimates were considerably different from those employed here.

Table 11—Poverty lines and poverty headcounts from past poverty analyses in Malawi

Poverty line	Source	Note	Year	MK poverty line	Poverty headcount
$40 per person per year	World Bank 1990	Corresponds to cost of 200 kg maize in 1990, plus proportional nonfood component (food cost accounts for 65% of total expenditures in rural areas; 55% in urban)	1989	Rural: MK93 per person per year	Rural: 60%
				Urban: MK96 per person per year	Urban: 9%
Calorie needs line	World Bank 1995	Extreme poverty line—cost of 200 kg of maize—annual per capita calorie requirement. Used National Sample Survey of Agriculture (NSSA) income data only for rural zone.	1992-93	Rural: MK98 per adult equivalent per year	Rural: 30%
Basic needs line	World Bank 1995	Cost of 200 kg of maize, plus cost of minimum nonfood essentials. Used NSSA income data only for rural zone.	1992-93	Rural: MK151 per adult equivalent per year	Rural: 43%
1990 reference line	World Bank 1995	CPI adjustment of 1990 $40 per person per year poverty line. Used NSSA income data only for rural zone.	1992-93	Rural: MK172 per adult equivalent per year	Rural: 54%

An attempt was made with the data from the IHS to replicate methods used earlier to derive comparable poverty measures. If successful, this would have provided some insights into national trends in poverty incidence. However, it was impossible to do this with any degree of confidence in the results. Problems included reconciling income versus consumption as household welfare measures and appropriately adjusting MK values and grain prices from 1990 or 1995 to April 1998. Nonsensical results were obtained, indicating unrealistically low levels of poverty in 1998.

No trends could be established by comparing this analysis with previous ones or using earlier methods with IHS data. The most we can say is that poverty in Malawi does not seem to be declining. However, the evidence is not strong enough to infer that poverty levels are increasing.

Although strong comparisons cannot be made with earlier poverty analyses, it is worth noting that this poverty analysis is designed to be repeated. If carried out in a similar manner on a new household survey data set, a future analysis should permit strong conclusions on trends in poverty incidence.

Poverty Measure Comparisons with Neighboring Countries

Table 12 presents poverty headcounts and Gini coefficients for neighboring countries that undertook poverty analyses in the 1990s. The data indicate that the level of poverty in Malawi was not exceptional. Both Zambia and Mozambique had slightly greater incidence of poverty. Similarly, the degree of inequality in consumption in Malawi was comparable to other countries with similar levels of urbanization. Countries with higher levels of urbanization than Malawi's tended to have higher Gini coefficients.

Table 12—Poverty headcounts and Gini coefficients (individual consumption) of neighboring countries

Country	National poverty headcount	Rural poverty headcount	Urban poverty headcount	National Gini coefficient	Survey year
Malawi	65.3	66.5	54.9	0.401	1997-98
Kenya	42.0	46.4	29.3	0.445	1992
Lesotho	49.2	53.9	27.8	0.560	1993
Madagascar	70.0	77.0	47.0	0.460	1993-94
Mozambique	69.4	71.2	62.0	0.396	1996-97
Rwanda	51.2	-	-	0.289	1993
Tanzania	51.1	-	-	0.382	1991
Uganda	55.0	-	-	0.392	1993
Zambia	68.0	88.0	46.0	0.498	1991
Zimbabwe	25.5	31.0	10.0	0.568	1990-91

Source: World Bank 2000.

4. Policy Implications

Poverty in Malawi can be classed as deep and pervasive. The consumption level of just over 65 percent of the country's population in 1998 was deemed insufficient to meet their basic needs. In addition, 28 percent of the poor were in ultra poverty.

The results presented are important as a first step in addressing poverty in Malawi. They offer a needed description of the country's poor and their characteristics. The findings contribute important insights for developing effective poverty reduction policies and programs. Indeed, the Malawi PRSP, completed in April 2002, used this analysis in its summary profile of poverty and to establish several major impact targets (Malawi 2002, 19).

The poverty measures have several policy implications for targeting poverty reduction interventions. Figure 1 shows the cumulative distribution of consumption for the nation, using the smaller 6,586 household data set. Focusing on the graph that shows the area of the poverty gap (defined by the vertices A, B, and C) and the arc of the ultra-poverty gap (defined by the vertices A, D, and E) contributes to understanding the effect of targeting certain subgroups of the poor to raise their welfare. For instance, raising the consumption of the poorest 10 percent of the poor (graphically, those households closest to point A in the graph in Figure 1) to above the poverty line would reduce the poverty gap by 19 percent and poverty severity by 39 percent. In contrast, the poverty gap and poverty severity will decline by only 1.2 percent and 0.1 percent, respectively, if the top 10 percent of the poor (graphically, those households just below point C in the graph) are made nonpoor. However, eliminating the poverty of any 10 percent of the poor, regardless of whether households are located near point A or near point C in Figure 1, would reduce poverty incidence by 6 percent. Consequently, attention must be paid to more than the poverty headcount for poverty reduction strategies to have maximum effect. However, given available resources, it may be more desirable to *reduce* the consumption shortfall of a larger proportion of the poor than to *eliminate* the shortfall of a smaller proportion.

Obviously, the ultrapoor are more vulnerable, and a poverty reduction strategy should target them first. What would happen to poverty measures if the ultra poor were brought just above the ultra-poverty line? Graphically, this strategy would change the shape of the cumulative distribution below the poverty line in Figure 1 from AEC to DEC. The estimates indicate that this hypothetical poverty reduction intervention would greatly reduce the depth and severity of poverty in Malawi. The poverty gap would reduce by 22 percent and poverty severity by 46 percent. As highlighted earlier, the headcount measure, however, would show no change in poverty incidence, despite a significant reduction in the deprivation of the poorest as a result of this hypothetical intervention.

The Malawi PRSP seeks to target the ultra poor, at least as evidenced by the design of its monitoring and evaluation indicators. While the target is a 5 percent reduction in the overall poverty headcount by 2005, the government has greater ambitions for the ultra poor. It would like to see an ultra-poor poverty headcount of 20 percent by 2005, a reduction of over 8 percent. Strategy programs, if developed with these objectives in mind, will not generate large reductions in the number of the poor. However, the implementation of the strategy's programs should result in a reduction in the misery experienced by Malawi's most destitute, even if all of their basic needs remain unmet.

In sum, this analysis suggests that the government should contemplate reducing poverty from the bottom up to achieve maximum impact with available resources in reducing the sufferings of the poor. The Malawi PRSP has adopted a similar perspective. The process requires identifying Malawi's poorest. In any administrative targeting effort, however, the major challenge facing policymakers is to develop a feasible, accurate, and low-cost system to identify the target group.

A promising way to identify the poorest is to carry out a proxy means test. This relies on indicators that are highly correlated with household income or expenditure, yet are easy to collect, observe, and verify (Ahmed and Bouis 2002). A profile of the

characteristics of the poor based on this poverty analysis suggests key household characteristics to consider in devising such a targeting tool (NEC 2000).

The 1997–98 IHS provided a data resource on poverty of considerable value for development planners in Malawi. This document presents an initial examination of the data set from a poverty perspective. However, technical solutions are not sufficient. They must be coupled with the necessary political will to have any impact on the poor. Nevertheless, this study provides a basis upon which to advance the effort of reducing poverty in Malawi.

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