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KENYA: POVERTY PROFILES, 1982-92

By

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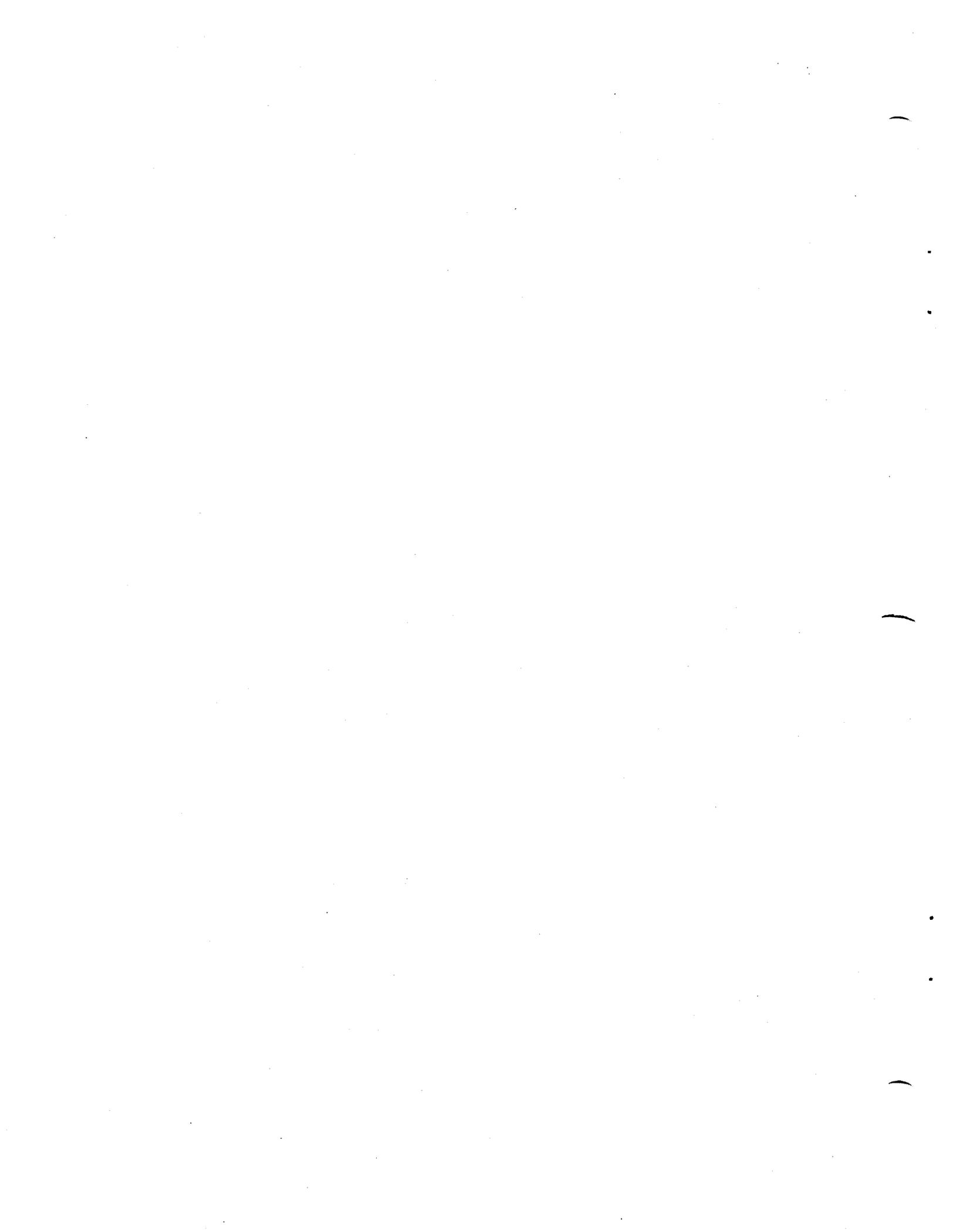


TABLE OF CONTENTS

KENYA: POVERTY PROFILES, 1982-92

	Page No.
EXECUTIVE SUMMARY	iii
1. INTRODUCTION	
2. DIMENSIONS OF THE PROBLEM	
3. CONCEPTS AND DEFINITIONS	
Poverty	
Poverty Line	
Regional price deflators	
Equivalence scales	
Measures of poverty	
Measures of inequality	
4. BACKGROUND ON THE REQUISITE HOUSEHOLD BUDGET SURVEYS	
Rural Household Budget Survey, 1981/82	
Survey Techniques	
Comments on the 1981/82 Rural Household Budget Survey Data	
Procedures for Determining Income and Expenditure	
The National Welfare Monitoring Survey, 1992	
Survey Techniques	
Comments on the Design of the Welfare Monitoring Survey, 1992	
Procedures for Determining Income and Expenditure	
Macro-Economic Conditions During the Survey Periods	
5. EMPIRICAL DETERMINATION OF THE POVERTY LINE	
Cost of Calories Intake Function Approach	
Linear Programming Approach	
Double Logarithmic Approach Assuming Food Poverty Line is Known	
Estimation of Non-Food Share Assuming Food Poverty Line is Known	
Derivation of Regional Price Deflators	
6. THE EXTENT, DEPTH AND SEVERITY OF RURAL POVERTY, 1981/82	
Analysis of Rural Food Poverty, 1981/82	
Analysis of Rural Poverty, 1981/82: Absolute Poverty Line	
Analysis of Rural Poverty, 1981/82: Relative Poverty Lines	

Socio-economic Characteristics of the Rural Poor, 1981/82
Sources of Income by Rural Poverty Group, 1981/82
Consumption and Expenditure Patterns by Poverty Group, 1981/82
Ownership of Assets in Rural Kenya, 1981/82
Housing and Access to Amenities, Rural 1981/82

7. **THE EXTENT, DEPTH AND SEVERITY OF POVERTY, 1992**
Analysis of Rural Food Poverty, 1992
Analysis of Rural Poverty, 1992: Absolute Poverty Line
Analysis of Rural Poverty, 1992: Relative Poverty Lines
Socio-Economic Characteristics of the Rural Poor, 1992
Consumption Patterns by Rural Poverty Group, 1992
Sources of Income by Rural Poverty Group, 1992
Ownership of Assets in Rural Kenya, 1992
Overview of the Extent of Urban Poverty, 1992
Housing and Access to Amenities, Rural and Urban 1992
8. **BASIC NEEDS AND POVERTY, 1992**

Health
Education

9. **THE DEGREE OF INEQUALITY IN KENYA, 1982-92**

REFERENCES

ANNEX 1: STATISTICAL APPENDIX

ANNEX 2: METHODOLOGICAL ISSUES
Survey Organization
Other Supportive Data and Methodological Issues

ANNEX 3: COMPARISON OF WEEKLY AND MONTHLY RECALL FOOD PURCHASES DATA

ANNEX 4: CONFIDENCE INTERVAL AND HYPOTHESIS TESTING

TEXT TABLES:

- Text Table 1: Rural Household Budget Survey, 1981/82 Sample Size
- Text Table 2: Welfare Monitoring Survey, 1992 Response Rates (%)
- Text Table 3: Food Poverty Line using the Cost of Calories Function, 1981/82 (%)
- Text Table 4: Overall Poverty Line using the Cost of Calories Function, 1981/82 (%)

- Text Table 5: Non-Food Poverty Line using the Cost of Calories Function, 1981/82 (%)**
- Text Table 6: Summary: Cost of Calories Function, 1981/82 (%)**
- Text Table 7: Contribution of Food Items in Total Food Budget by Province, 1981/82 (%)**
- Text Table 8: Demand Elasticities for Calories with Respect to Food Expenditure, 1982-92**
- Text Table 9: Food Poverty Lines by Region using the Wasay Method, 1982-1992**
- Text Table 10: Summary of Regression Estimations of Poverty Line Assuming Food Poverty Line is Known**
- Text Table 11: Overall Poverty Lines on Purged Total Expenditure, 1982-92**
- Text Table 12: Mean Adult Equivalent Expenditures by Province, 1982-92**
- Text Table 13: Regional Food Price Deflators, 1982-92**
- Text Table 14: Regional Price Deflators: An Illustration**
- Text Table 15: Regional Prevalence of Calorie Deficiency and Monetary Food Poverty, 1981/82 (%)**
- Text Table 16: Provincial Status of Rural Poverty, 1981/82 (%)**
- Text Table 17: Regional Comparative Advantage by Major Crop Groups, 1989**
- Text Table 18: Provincial Status of Rural Poverty, 1992 (%)**
- Text Table 19: Agricultural Production Accounts, 1981/82**
- Text Table 20: Agricultural Production Accounts, 1992: Rural Data**
- Text Table 21: Decomposition of $P\alpha$ Poverty Measures by Region, Urban 1992**
- Text Table 22: Prevalence of Sick Individuals by Region and Poverty Group, 1992 (%)**
- Text Table 23: Types of Sickness by Poverty Group, Rural 1992 (%)**
- Text Table 24: Types of Sickness by Region, Rural 1992 (%)**
- Text Table 25: Actions Taken to Remedy the Sickness, Rural 1992 (%)**
- Text Table 26: Types of Sickness for Those Who Attended Health Facility or Purchased**

Drugs, Rural 1992 (%)

- Text Table 27: Literacy Rates by Regions and Poverty Groups, 1992 (%)**
- Text Table 28: Literacy Rates by Region, 1980/81, 1988 and 1989 (%)**
- Text Table 29: Primary School Gross Enrolment Rates, 1992 (%)**
- Text Table 30: Primary School Net Enrolment Rates, 1992 (%)**
- Text Table 31: Secondary School Gross Enrolment Rates, 1992 (%)**
- Text Table 32: Secondary School Net Enrolment Rates, 1992 (%)**
- Text Table 33: Primary School Age/Grade Mismatch, 1992 (%)**
- Text Table 34: Secondary School Age/Grade Mismatch, 1992 (%)**
- Text Table 35: Degree of Inequality in Kenya, 1982, 1992**
- Text Table 36: Distribution of Income in Kenya, 1982 and 1992**

KENYA: POVERTY PROFILES, 1982-92 EXECUTIVE SUMMARY

INTRODUCTION

i. Kenya has a fairly developed statistical base on macroeconomic accounts. But there is no recent direct statistical evidence on poverty and the trend in the distribution of household incomes. The latest estimates are for 1974/75, arising from surveys undertaken within the framework of the Integrated Rural Surveys (IRS). In the 1980s, CBS undertook two major surveys on rural and urban household incomes and consumption patterns: the Rural Household Budget Survey 1981/82; and the Urban Household Budget Survey 1982/83.

ii. The purpose of this study is to fill the gaps by updating the poverty assessment for the period 1982-92 using the 1981/82 Rural Household Budget Survey, 1982/83 Urban Household Budget Survey (UHBS), and the Welfare Monitoring Survey (WMS1) undertaken in December 1992. However, the 1982/83 UHBS database could not be used since the database provided was in very aggregated form, did not include key variables on household characteristics e.g. household members' age, educational characteristics (except the household size) and expenditure on key food items, mainly maize and bread. To make meaningful comparisons with previous studies based on the 1974/75 IRS database, the methodology used follows that of the poverty analysts of the IRS database, namely Foster, Greer and Thorbecke.

CONCEPTS AND DEFINITIONS

iii. To analyze how the welfare of the poor has changed in a region or country, we need to answer two questions. First, which individuals are poor and who are not? Secondly, how much poverty is there in aggregate? The first question involves defining the poor and the poverty line, while the second question broadly deals with aggregate measures of welfare. Since data is collected at the household level while our unit of analysis is the individual, we have to apply appropriate weights (adult equivalence scales) to individuals in the household on the basis of age and sex to reflect both differences in requirements.

Poverty

iv. The definition of poverty used in the analysis is that, with given resources, if a household manages prudently and still finds that it cannot afford the necessary calorie intake, it is considered poor. There are two important issues embedded in this definition. First, items of consumption other than food will be taken into account. Secondly, if a family does not meet its calorie requirements but has a relatively high income, the household will not be considered poor. There are potentially two ways of deriving poverty lines, the absolute and relative methods. An absolute poverty line is fixed over time and space, i.e. over the entire area and period to be covered in the study. The absolute poverty line will be the cost of food expenditure necessary to attain a recommended food intake, and a modest allowance for non-food items. A relative poverty line is set at a constant proportion of the national mean income. Relative definitions of poverty explicitly allow the poverty threshold to be dependent on the community one is studying, based on the notion that poverty is a situation in which one cannot take part in the ordinary way of life of the community one is living in. The study will use four poverty lines: (a) a relative poverty line set at 66% of mean consumption expenditure levels to define the "poor"; (b) a relative poverty line set at 33% of mean consumption levels to define the "hard-core poor" or "ultra-poor"; (c) an absolute poverty line based on minimum energy requirements; and (d) an absolute hard core poverty line which assumes that a household whose total expenditure is not sufficient to meet its minimum food requirements is ultra-poor.

Regional Price Deflators

v. One important step in spatial and inter-temporal comparison of monetized variables is to inflate (deflate) raw data in order to bring all values to a common denominator (e.g. Nairobi, December 1982=100). The first step in inflating or deflating a time series is to obtain a consumer price index to measure the price of a "market basket of goods". In this study, the problem will be complicated by (a) the inadequacy and reliability of price data generated by the Central Bureau of Statistics, and (b) the lack of a robust theoretical methodology of

deriving spatial differences in the cost of living. In order to compare the 1981/82 Rural Household Budget Survey and 1992 Welfare Monitoring Survey, provincial price deflators will be applied to adjust household consumption expenditure levels for regional price variations.

Equivalence Scales

vi. Although survey data is collected at the household level, the interest is usually on the individual consumption, which is not observed directly. Since expenditure (and food consumption) levels differ by age and sex, the household data has to be adjusted to take account of the demographic factors before a meaningful comparison of household welfare is undertaken. This is done by the use of adult equivalence scales, which take into account (a) economies of scale in household consumption and (b) the existence of child goods in contrast to adult goods. The equivalence scale designed by OECD in 1982 implies that for every additional adult, a household needs 0.7 times the resources of the first adult (denoting economies of scale in household consumption) and for all children younger than 14 years, it needs 0.5 times the resources of the first adult.

vii. The earlier studies on poverty in Kenya used equivalence scales developed by Anzagi and Bernard (1977). The adult equivalence scales developed by Anzagi and Bernard covers age groups of 0-4 (weighted as 0.24), 5-14 (weighted as 0.65), and ages 15 and above (weighted as 1.0). The adult equivalence scales developed by Anzagi and Bernard will be used in this study to generate adult equivalent expenditures from the 1981/82 Rural Household Budget Survey and the 1992 Welfare Monitoring Survey.

Measures of Poverty

viii. The degree of poverty will depend on the *incidence* of poverty (numbers in the total population below the poverty line), the *intensity* of poverty (the extent to which the incomes of the poor lie below the poverty line), and the degree of *inequality* among the poor. In addition to reflecting the three dimensions, a poverty index should also be decomposable among sectors and socio-economic groups. A summary measure which meets the four requirements is that of Foster, Greer, and Thorbecke (FGT). If real expenditures or income are ranked as follows:

$$Y_1 \leq Y_2 \leq \dots \leq Y_q < z < Y_{q+1} \leq \dots \leq Y_n$$

where z is the poverty line, n is the total population, and q is the number of poor, the FGT measure is:

$$P\alpha = (1/n)\sum[(z - Y_i)/z]^\alpha; \alpha \geq 0.$$

The poverty measure takes the proportional shortfall of income for each poor person $[(z - Y_i)/z]$, raises it to a power (α) which reflects societies' concern about the depth of poverty, takes the sum of these over all poor households, and normalizes by the population size.

ix. The parameter α is a policy parameter that reflects concern for the poor; as α increases greater weight is attached to the poverty gap of the poorest. The main measures in this study are (a) the "head-count index" ($\alpha=0$), which measures the prevalence of poverty and is insensitive to how far below the poverty line each poor unit is; (b) the "income-gap ratio" ($\alpha=1$), the average of the poverty gaps expressed as a fraction of the poverty line; and (c) $\alpha=2$, which gives the severity of poverty. The head-count index (H) simply shows the proportion of the people below the poverty line. However, the income-gap ratio (HI) takes into account both the incidence of poverty (H) and its intensity (I). The sum of the poverty gaps is the total income required to eliminate poverty. The income-gap ratio is insensitive to income distribution among the poor. The FGT index is sub-group decomposable. The decomposition of national poverty into provincial, district, occupational or other groups will help in developing poverty profiles for Kenya.

RURAL HOUSEHOLD BUDGET SURVEY, 1981/82

x. The RHBS utilized the multi-stage NASSEP II frame. The sample of households was obtained through the selection of Primary Sampling Units from the 1979 Population Census, followed by the selection of clusters

and finally the households within a cluster. Each cluster had about 100 households from which a 10% sample was selected for interview. In all, 648 clusters were selected which contained more than 69,000 households, or about 2.8% of the rural population. Overall, 27 strata were formed. North-Eastern province and the northern districts of Rift Valley (Turkana and Samburu) and Eastern province (Marsabit and Isiolo) were excluded. The exclusions comprised 54% of the total land area and 5% of the national population. The following sparsely populated contiguous districts were merged to form common strata: Kilifi/Tana River/Lamu, Baringo/Laikipia, Narok/Kajiado and West Pokot/Elgeyo Marakwet. The rest of the districts were covered separately as distinct strata.

xi. The data made available to the consultant was not the original data entered from the questionnaires, but data aggregated or truncated by systems analysts. Information on the age of individual household members was not available since it was aggregated to number of members per household per specified age group by sex. The differentiated age groups, classified also by sex, included 0-4 years, 5-9, 10-14, 15-19, 20-29, 30-39, 40-49, and 50 and above. The age categories in the aggregated data permitted the use of adult equivalence scales developed by Anzagi and Bernard which requires age groups of 0-4, 5-14, and ages 15 and above. Household size derived by summing up household members by age groups was different from that of summing up using relation to household head ("daughters", "sons", and "other relatives") in some cases.

xii. Rent is excluded from the analysis, both on the expenditure and income side, since the enumerators were only required to record imputed rent if the cluster was urban. A total of 5,786 households (96.4%) did not respond on the rent variable since the survey was on rural households. Omission of imputed rent component is not a serious source of error in the analysis of a rural household budget survey.

THE NATIONAL WELFARE MONITORING SURVEY, 1992

xiii. The National Welfare Monitoring Survey (WMS1) was a priority survey whose main objectives were the identification of policy target groups and the production of key socio-economic indicators describing the wellbeing of different groups. The primary purpose of the Welfare Monitoring Survey was to gauge the present and future net socio-economic consequences of economic management and structural adjustment in Kenya.

xiv. WMS1 collected data during November and December 1992 in 44 districts in the republic, excluding Turkana, Marsabit and Samburu. Data from North Eastern province was obtained from urban clusters only, and its results do not therefore represent rural areas of the province. The questionnaires were intended to capture information on household characteristics, household expenditures, household incomes, assets and amenities owned and availed to the households, and land utilization.

xv. The following comments on the design and the conceptual issues relating to the 1992 National Welfare Monitoring Survey do not necessarily imply that the analysis based on the data is invalid. The comments have primarily been spurred by the fact that the 1992 WMS1 was the first in a series of future surveys. In general, the enumerators' reference manual was brief. The comments will, however, be based on the printed enumerators' reference manual.

xvi. The main economic status was defined in relation to "time spent per day on the activity", rather than the main source of income as is ordinarily the case. Time spent per day is ordinarily defined in relation to "main occupation" rather than "economic status". There might have been confusion between "export-oriented", "cash crop", "food/subsistence farmers" and "pastoralists". First, the farmer might not know whether his/her crop is exported if it is a cash crop, due to the fact that most export crops are also consumed locally. Food/subsistence farmer was defined as a "person engaged in the production of food crops for home consumption" while a "pastoralist" was defined as a "person engaged in animal husbandry". Pastoralism is not normally defined in the sense used in WMS1, but also includes the concept of mobility of the household or some household members and the livestock in search of better pastures. The "main economic status" variable could also not be used to distinguish between employees and those working on own-account, i.e. "self-employed", in various sectors.

xvii. It is not feasible to compute itemized food expenditure since consumption from own-production was

not itemized. The estimates of total food expenditure excludes food gifts-in since they are grouped with other in-kind and cash gifts, which implies an understatement of consumption. The data deficiency in terms of itemized food expenditures made it impossible to analyze the consumption patterns of the poor in any meaningful detail.

xviii. The enumerators' reference manual did not clarify that house rent should only be imputed as income only if it is not included in the reported salary. Income from wage/salary employment includes payments to owner-occupiers, while "rents last month" also counts payments to owner-occupies as income, thereby double-counting the income source. However, it is not possible to drop "rents last month" from the analysis since it also includes all receipts from renting of residential/business premises and land.

xix. In the case of agricultural income, the costs of inputs to livestock production are not itemized. The lack of specificity in the enumerators' reference manual on whether costs of hired labour were collected in the survey, and the difficulty of allocating total agricultural income by source (cash/export crops, food crops, livestock income) made it difficult to differentiate types of farmers in socio-economic grouping.

xx. Since the "main job" refer to paid employment for household head and/or spouse, it is expected that the item "domestic work" refers to employment in other households, which is not a widespread phenomenon for household heads. Under employment status, legends "own" and "employer" should have the same meaning, although they are presented as mutually exclusive options. In addition, when the legends for "main job", "type of industry" and "employment status" are interpreted jointly, some string codes can not be meaningfully read.

DETERMINATION OF THE POVERTY LINE

xxi. The food poverty line is a classic linear programming (LP) problem, where the individual aims to achieve a certain minimum nutrition level at the lowest possible cost. However, as is evident from the classical LP problem, the only region- or country-specific data used in the derivation of the food poverty line is prices, as the other variables (required dietary allowance, calorific content of food, and minimum quantities required for each commodity) are exogenously determined. The classical LP solution may therefore imply consumption patterns that do not correspond to local tastes and preferences, and/or the local supply of the commodities.

xxii. An improvement of the classical LP approach was developed by Wasay (1977). Wasay took the existing amounts of calories contributed by each major food item in the budget of low income families from household budget survey data and standard food weight-to-calorie ratios. The percentage of the total calorie intake attributable to each item was then applied to the RDA (2250 calories per day in our study) to calculate the desired consumption levels of the various food items. Finally, the minimum expenditure on each item was derived using the respective commodity prices. This ensures that the consumption basket corresponds with local consumption and production patterns.

xxiii. To determine the overall poverty line, it is necessary to compute the expenditure by the poor on non-food items. For our purposes, non-food expenditure items include beverages (soft drinks and beer) since they are of low nutritional value compared to other food items. The share of non-food in total expenditure of adult equivalent households in the band of -20% and +10 % on either side of the food poverty line was used to determine the non-food expenditure. The poverty line was adjusted downwards so that food-poor households with relatively high non-food expenditures are counted as non-poor.

xxiv. It is important to recognize that poverty lines in Kenya have previously been estimated using a modified LP approach by Thorbecke and Crawford. The Thorbecke-Crawford diet consisted of maize and beans in a 70/30 proportion. They derived a poverty line assuming a daily per adult equivalent calorie intake of 2250 calories, and using information available on current prices, food weight-to-calorie conversion factors, and the share of food in total expenditure.

xxv. An innovative method of deriving the poverty line developed by Greer and Thorbecke (1986) is the cost of calorie function. The raw household budget survey data is converted to per adult equivalent calorie intake levels using calorie conversion tables. Letting X_j represent food expenditure and C_j be calorie

consumption, both per adult equivalent, Greer and Thorbecke specified the cost of acquiring a given number of calories.

$$\ln(X) = a + bC.$$

The poverty line Z is the estimated cost of acquiring the required RDA, R .

$$Z = e^{(a + bR)},$$

where α and β are the coefficient estimates of a and b , respectively. A poverty line including non-food items can be derived using the total expenditure as the independent variable in the cost of calories function. However, a source of errors in the cost of calories function is that the variables in our computations, the calorie intake and the expenditure, are *observed* as one variable, which implies that the measurement errors are common to both the calorie availability and expenditure data. As income rises, rich families are likely to consume more expensive calories, leading to an upward bias in b calculated from the cost of calories function.

Poverty Line Estimates

xxvi. The rural food poverty line in 1981/82 average prices using the Wasay method was Shs 87.90 compared to Shs 78.18 using the cost-of-calorie function. The respective figures for the overall rural poverty line, including expenditure on non-food, were Shs 105.94 and Shs 113.52. One striking feature of the results is that Central province had the highest food poverty line under both methods. The Central province poverty line using the costs-of-calorie function was rather high (39.6% above the national mean), due to the province's consumption of high expensive calories (mainly protein sources).

xxvii. The 1992 food poverty lines for Nairobi and the provinces were developed using food consumption weights derived from the 1981/82 Rural Household Budget Survey, the respective region's prevailing prices, and methodology developed by Wasay (1977) for urban Pakistan. The adult equivalent food poverty line for Nairobi and Mombasa was derived as Shs 514.25 in December 1992, and a non-food share of Shs 495.45, giving an overall urban absolute poverty line of Shs 1,009.70.

THE EXTENT, DEPTH AND SEVERITY OF RURAL POVERTY, 1981/82

Analysis of Rural Food Poverty, 1981/82

xxviii. The Table below shows the extent, depth and severity of food poverty at provincial levels. District-level data should be interpreted with caution due to increase in sampling errors as sample size decreases. During 1981/82, the head-count ratio of food poor adult equivalents was highest in Nyanza (77.1%), followed by Coast (76.3%), Western (73.3%), Rift Valley (69.6%), Eastern (64.6%) and Central (37.9%). The national average head-count ratio was 65.5% on the basis of adult equivalents, and 54.5% of households.

xxix. Central province had the lowest depth (10.1%) and severity index (4.1%), while Nyanza had the highest depth (30.5%) and severity (15.2%), compared with the national averages of 23.4% (depth of poverty) and 10.9% (severity of poverty). The most food-poor districts were Kisii (89.2%), West Pokot/Elgeyo Marakwet stratum (84.2%), Busia (82.8%), Kilifi/Tana River/Lamu stratum (81.3%) and Kitui (80.7%), while the least food-poor districts were Nyeri (27.6%), Kiambu (34.2%) and Murang'a (37.9%). However, food poverty statistics are of limited policy relevance since they include households who can meet the required minimum calories if they spent less on non-foods or consumed more calorie-intensive diets.

xxx. The estimations of food poverty using food poverty line derived on a modified LP approach were made on the basis of the 1974/75 Integrated Rural Surveys (IRS) smallholder database (Crawford and Thorbecke, 1980). The national head-count ratio, i.e. households below food poverty line, were estimated at 25.3% in 1974/75. The IRS database ranked Coast as most food-poor, followed Western, Nyanza, Eastern, Rift Valley and Central. However, there may be two major points to note in the comparison. First, the IRS database was on the smallholder sector (who are likely to meet a relatively higher proportion of their food requirements from

consumption of own produce), while the 1981/82 Rural Household Budget Survey database did not target a particular segment of households. Secondly, the sample sizes in the IRS were smaller, for example Coast had 64 responding smallholder households, while Rift Valley had 83. The sampling errors in the estimations were therefore higher for the IRS database.

Analysis of Rural Poverty, 1981/82: Absolute Poverty Line

xxxii. During 1981/82, the head-count ratio poor adult equivalents was highest in Nyanza (57.9%), followed by Coast (54.6%), Western (53.8%), Rift Valley (51.1%), Eastern (47.7%) and Central (25.7%). The national average head-count ratio was 47.9% on the basis of adult equivalents, and 39.5% by households. At the strata level, the districts with the highest prevalence of absolute poverty were Kitui (71.3%), Kisii (65.0%), West Pokot/Elgeyo Marakwet (62.5%), Kilifi/Tana River/Lamu stratum (62.1%), Busia (61.5%), and Kericho (60.8%). Three districts of Central province exhibited the lowest prevalence of poverty, with Murang'a being the least poor district in Kenya as of 1981/82. Central province had the lowest depth (6.7%) and severity index (2.7%), while Coast had the highest depth (18.6%) and severity (8.2%), compared with the national averages of 14.9% (depth of poverty) and 6.4% (severity of poverty).

xxxiii. The data was also analyzed using the food poverty line per equivalent adult as the poverty line to be used on total expenditure. The poverty line was justified as an alternative measure of hard core poverty on the basis that, if total expenditure of a rural household is below its minimum food needs, then that household should be defined as ultra-poor. However, the same definition can not be used in an urban environment since urban non-food needs are relatively large and some are un-avoidable. During 1981/82, the highest prevalence of rural "hard core" poverty was in Coast (43.9 per cent), followed by Nyanza (40.1 per cent), Western (39.9 per cent), Rift Valley (38.3 per cent), Eastern (33.4 per cent) and Central (16.0 per cent).

Analysis of Rural Poverty, 1981/82: Relative Poverty Lines

xxxiv. Relative poverty lines were established at 2/3 of the rural national mean (Shs 114.35) to define the poor and 1/3 to define the "hard core" poor. Nyanza was ranked poorest with 64.8% prevalence of poverty, followed by Coast (59.8%), Western (57.6%), Rift Valley (55.9%), Eastern (52.7%), and Central (30.4%). The prevalence of relative hard core poor was 11.3% on average, while it was highest in Coast (16.0), followed by Western (14.9%), Rift Valley/Nyanza provinces (13.0%), Eastern (9.7%) and Central (4.5%). The depth of hard core poverty was highest in Coast (3.3%), while severity was also highest in Coast (1.0%).

	Provincial Status of Rural Poverty, 1981/82 (%)						
	All	Coast	Eastern	Central	Rift/V	Nyanza	Western
<u>Food poverty line</u>							
Prevalence (ad eq)	65.5	76.3	64.6	37.9	69.6	77.1	73.3
Prevalence (HHs)	54.5	63.6	54.8	28.7	58.2	64.7	65.1
Depth (ad eq)	23.4	29.4	21.6	10.1	25.3	30.5	26.4
Severity (ad eq)	10.9	14.5	9.5	4.1	11.9	15.2	12.3
<u>Absolute poverty line</u>							
Prevalence (ad eq)	47.9	54.6	47.7	25.7	51.1	57.9	53.8
Prevalence (HHs)	39.5	43.6	40.2	19.1	42.8	47.6	48.0
Depth (ad eq)	14.9	18.6	14.0	6.7	16.7	17.9	17.4
Severity (ad eq)	6.4	8.2	5.7	2.7	7.3	7.7	7.6
<u>Absolute Hard core poverty line</u>							
Prevalence (ad eq)	34.5	43.9	33.4	16.0	38.3	40.1	39.9
Prevalence (HHs)	27.7	33.3	27.5	11.8	31.4	32.9	33.9
Depth (ad eq)	9.5	12.2	8.5	3.9	11.0	11.4	11.3
Severity (ad eq)	3.7	4.8	3.2	1.5	4.4	4.5	4.5
<u>Relative poverty line</u> (2/3 of national mean)							
Prevalence (ad eq)	53.0	59.8	52.7	30.4	55.9	64.8	57.6
Prevalence (HHs)	44.3	49.0	44.9	23.3	47.1	53.8	52.7
Depth (ad eq)	17.6	21.4	16.8	8.3	19.4	21.1	20.2
Severity (ad eq)	7.8	9.9	7.1	3.4	8.9	9.3	9.2

Socio-economic Characteristics of the Rural Poor, 1981/82

xxxv. The measures of prevalence, depth and severity of poverty were analyzed (using the absolute poverty line and the line defining the hard core poor as those households who can not meet their minimum food requirements even if they devoted all their expenditure on food) by sex of head of household, occupation of household head, educational status of household head, age of household head, household size, and land holding size. In the case of sex of household head, prevalence, depth and severity of poverty was higher for male-headed households using the absolute poverty line. The sex of household head was further broken down into "married" and "other" (single, separated, divorced) so as to be able to distinguish *de facto* (temporary but long-term absence of a male spouse) from *de jure* (lack of an adult male spouse) woman-headed households. Female-married (*de facto* woman-headed households) showed slightly less prevalence, depth and severity of poverty than *de jure* woman-headed households.

xxxvi. The ranking of poverty by occupation of household head showed that professional/managerial class was better off than agricultural-based workers (which combined those working on own or other people's holdings). Households whose household heads had attained secondary level education ranked least poor, followed by primary education, while the poorest did not have any formal education. As would be expected, household size was positively correlated with prevalence, depth and severity of poverty, while land holding size did not seem to be correlated with poverty, probably because the database did not reveal the agricultural potential. Poverty increase with age of household head, probably because age is highly correlated with household size, as children enrol in the household and vacate to form their own households over the household's life cycle.

xxxvii. The prevalence of absolute hard core poverty was lower for female-headed than for male-headed households, while female-married headed households showed only slightly less poverty than "female other". Socio-economic groupings by occupation of household head, education of household head and household size at the absolute hard core poverty line showed similar rankings with the absolute poverty cut-off point.

Consumption and Expenditure Patterns by Poverty Group, 1981/82

xxxviii. The poor spend large shares of their food budgets on maize (30.1%), milk products (11.5%), beans (9.6%), and meats (8.8%). The shares for the non-poor were maize (21.5%), milk products (13.5%), beans (9.0%), and meats (10.8%). Among the non-food items, the poor as defined using the absolute poverty line mostly spend on clothing (24.0%), non-durable (21.4%), fuel (11.6%) and education (11.0%). They spend relatively low shares on licenses/insurance, reflecting their humble ownership of assets (e.g. transport equipment), and recreation (3.0%). Since the percentage shares are as a proportion of the poor's budget, their absolute expenditures on recreation and insurance/licenses were very low.

xxxix. Within the food budget, the hard core poor (defined as those whose total expenditure is inadequate to meet their minimum food needs) spend their highest shares on maize (30.9%), milk products (10.8%), beans (9.8%), and vegetables (8.3%). The difference with the "non-hard core", i.e. those above the absolute hard-core poverty line, is most striking in maize consumption, where the corresponding budget share for "others" is 22.4%. Within the non-food budget, the hard core poor had high shares for (a) clothing (25.2%) and (b) non-durable (24.2%) e.g. furnishings, soaps, utensils, and domestic services – which probably reflects high levels of cleanliness and hygiene. As would be expected, the average share of food in total expenditure was highest for the hard core poor (75.2%), compared with 74.0% for the poor defined using the absolute poverty line, and 63.2% for all rural households during 1981/82.

THE EXTENT, DEPTH AND SEVERITY OF RURAL POVERTY, 1992

Analysis of Rural Poverty, 1992: Absolute Poverty Line

xxxx. The overall prevalence of rural absolute poverty was 46.4% by adult equivalents and 41.6% by households. The depth of poverty was 18.5%, while the overall severity of poverty was 9.8%. This is in contrast with the 1981/82 RHBS data, which showed an overall rural poverty prevalence, depth and severity

of 47.9%, 14.9% and 6.4%, respectively. The prevalence of poverty was highest in Western (54.8%), followed by Rift Valley (51.5%), Nyanza (47.4%), Coast (43.5%), Eastern (42.2%), and Central (36.0%). The provincial prevalence of poverty showed a slight overall reduction in absolute poverty during 1982-92, and the narrowing of gaps between the provinces. The districts with the lowest prevalence of poverty were Lamu/Tana River (20.6%), followed by Kajiado/Narok (25.1%), Kiambu and Meru/Tharaka (32.7%), Laikipia (34.4%), Nyeri (35.4%), Nyandarua (36.7%) and Murang'a (37.3%). The prevalence of poverty was highest in Busia (67.7%), West Pokot (65.2%) and Kericho/Bomet (64.7%). The depth of poverty was highest in West Pokot (35.4%) and Busia (33.3%).

Analysis of Rural Poverty, 1992: Relative Poverty Lines

xxxii. The overall rural prevalence, depth and severity of poverty were estimated at 57.2%, 24.7% and 13.9%, respectively. The poorest province under the relative poverty line, i.e. 2/3 of the mean adult equivalent expenditure, was Western (65.4%), followed by Rift Valley (60.8%), Nyanza (58.9%), Coast (54.1%), Eastern (53.6%), and Central (47.5%). The provincial rankings for depth and severity of relative poverty are similar to those of prevalence of poverty. The prevalence of relative hard core poverty, i.e. 1/3 of mean adult equivalent expenditure, was highest in Rift Valley (29.5%), followed by Western (29.3%), Nyanza (26.6%), Coast (18.2%), Eastern (16.7%), and Central (13.5%), compared with a national rural mean of 23.3%. The districts with the highest prevalence of relative hard core poverty were Busia (44.8%), West Pokot (40.0%), and Kericho/Bomet (40.2%). Kericho district consistently exhibited higher poverty levels than envisioned, both in 1982 and 1992.

Provincial Status of Rural Poverty, 1992 (%)

	All	Coast	Eastern	Central	Rift/V	Nyanza	Western
<u>Food poverty line</u>							
Prevalence (ad eq)	71.8	63.0	62.3	67.8	81.0	70.7	78.4
Prevalence (HHs)	63.8	53.8	55.2	57.8	72.1	63.5	74.2
Depth (ad eq)	34.0	26.1	22.8	27.9	45.0	34.8	39.9
Severity (ad eq)	20.6	14.5	11.7	14.8	29.9	21.6	25.0
<u>Absolute poverty line</u>							
Prevalence (ad eq)	46.3	43.5	42.2	35.9	51.5	47.4	54.8
Prevalence (HHs)	41.5	37.9	38.1	31.2	44.5	43.4	53.5
Depth (ad eq)	18.4	15.4	14.9	12.1	22.3	19.7	23.0
Severity (ad eq)	9.8	7.6	7.4	5.4	12.7	10.6	12.6
<u>Absolute Hard core poverty line</u>							
Prevalence (ad eq)	37.4	32.8	32.2	28.1	42.9	39.1	45.4
Prevalence (HHs)	32.8	27.4	29.1	24.2	36.2	34.8	42.9
Depth (ad eq)	13.7	10.9	10.5	8.1	17.4	15.1	17.6
Severity (ad eq)	7.0	5.2	5.1	3.4	9.5	7.6	9.2
<u>Relative poverty line</u> (2/3 of national mean)							
Prevalence (ad eq)	57.1	54.1	53.6	47.5	60.8	58.9	65.4
Prevalence (HHs)	51.9	46.3	49.3	41.6	53.0	55.5	64.0
Depth (ad eq)	24.6	21.7	21.1	17.7	28.6	26.1	29.8
Severity (ad eq)	13.8	11.4	11.1	8.7	17.1	14.8	17.3

Socio-economic Characteristics of the Rural Poor, 1992

xxxiii. The following variables were used separately to delineate socio-economic groups: sex of household head, education level of the head, household size, size of holding, and age of household head. Socio-economic grouping based on dominant source of household income was not used due to ambiguity of issues relating to agricultural income and paid employment income data.

xxxiii. The sex of the head of the household did not appear to be a significant factor in the determination of the incidence of absolute poverty. However, "female-married" headed households had prevalence of poverty of 44.6% at the absolute poverty line, compared with 52.9% for "female-other". The depth and severity of poverty were also lower in female-married compared with "female-other" households. The same pattern applies at the poverty line defining the hard core poor as those whose entire expenditure falls below the food poverty line.

xxxiv. When rural Kenyan households were ranked by economic status, the highest prevalence of hard core poverty was among subsistence farmers (52.3%), compared with informal sector workers (41.4%), and was lowest for public sector workers (21.2%). Using education level of the household head, the lowest prevalence of absolute poverty was among heads of households with secondary education (26.7%), compared with primary education (45.5%) and "no education" (57.4%). As was the case during 1981/82, poverty consistently increase with household size. Poverty measures using size of land holding did not portray any clear trend, probably because of different agricultural potential of land holdings. Poverty increases with the age of the household head. The ranking of poverty measures by socio-economic characteristics at the absolute poverty line were largely similar to those obtained using food poverty line on total expenditure.

Consumption Patterns by Rural Poverty Group, 1992

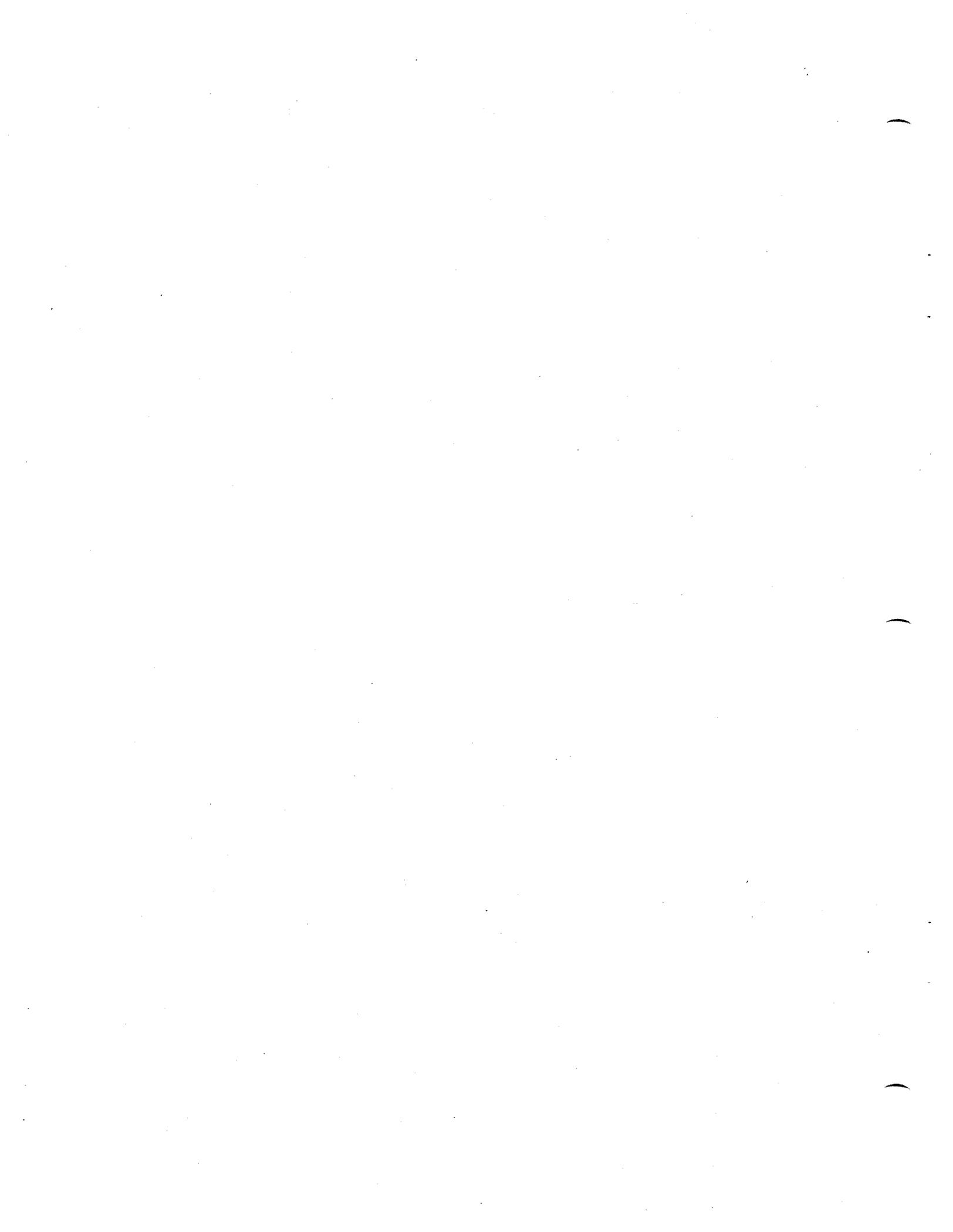
xxxv. Consumption patterns for food and non-food were computed at both the absolute poverty line and using the food poverty line on overall expenditure to define the absolute hard core poor. However, the itemized food budgets refer to purchases only since food consumption from own consumption were not itemized. Own consumption refer to both food crops and livestock, and accounted for 25.0% of rural food consumption. The poor (using the absolute poverty line) spend the larger proportions of their food budgets – including own consumption – on maize purchases (27.7%), followed by sugar (13.7%), compared with the non-poor whose expenditure on maize purchases was 23.8%. However, the figures should be interpreted with caution since it is not possible to establish maize consumption from own production.

xxxvi. The only consumption data which can be interpreted in any meaningful way is the share of food in total expenditure, and the itemized non-food expenditure since consumption of own produce is expected to be negligible for non-food expenditure. Within food, consumption of own produce was 25.0% in rural Kenya during 1992, compared with 25.7% for the non-poor (defined using the absolute poverty line) and 22.4% for the poor. This low level of consumption of own produce by the poor means that they are heavily dependent on the market for food, thereby raising their vulnerability to pricing policies affecting the major food crops.

xxxvii. Within non-food, clothing had the highest share (24.5%), followed by education (14.7%), transportation (9.8%) and domestic wages (9.0%). The proportion of the poor's budget spent on recreation was a meagre 2.3% of their non-food expenditures. Education expenditures took an overall share of about 7.6% of all rural poor's expenditures. The share of food in total expenditure was lower than expected: 48.7% for the entire rural population, 61.2% for the poor using the absolute poverty line, and 61.7% for the absolute hard core poor.

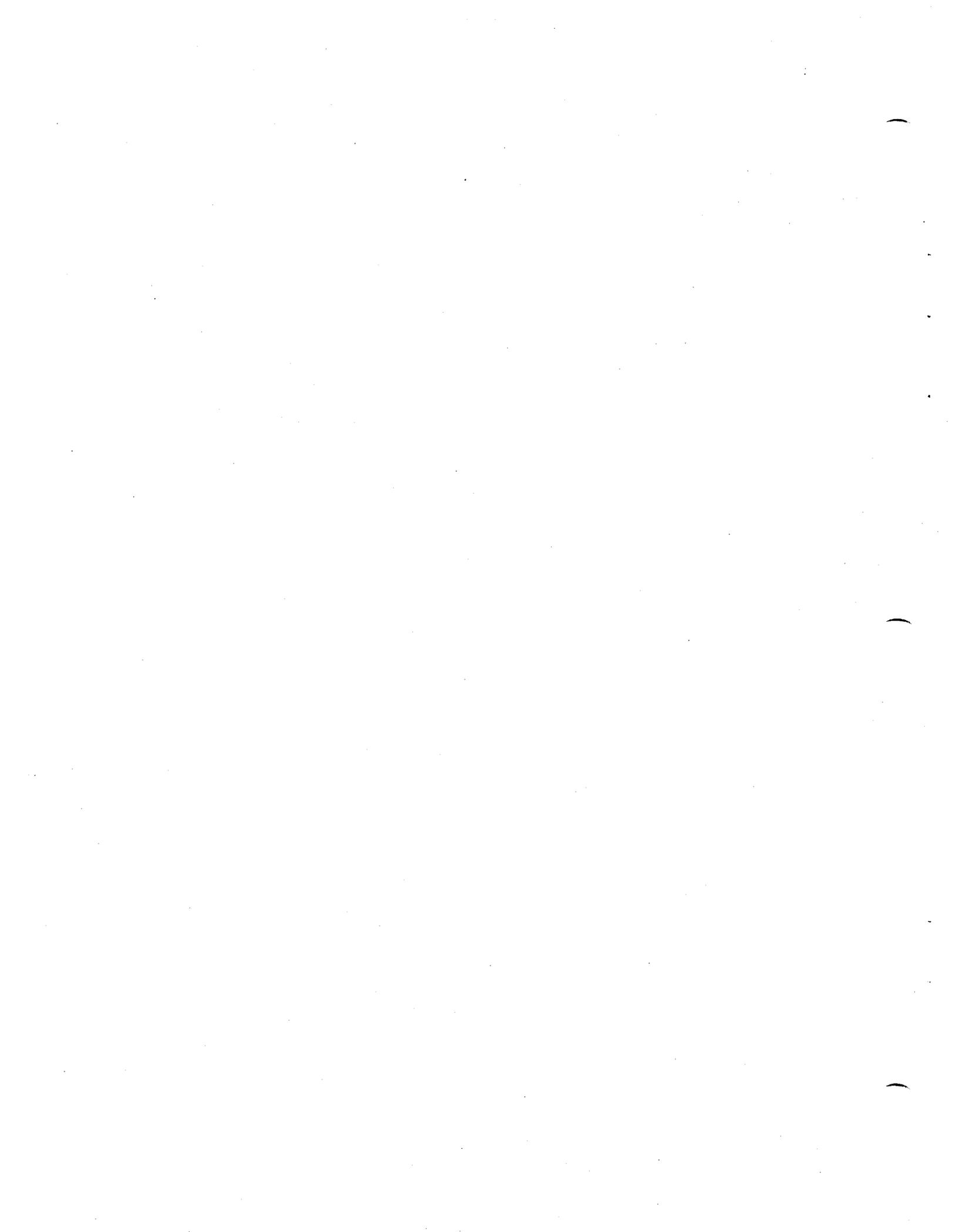
OVERVIEW OF THE EXTENT OF URBAN POVERTY, 1992

xxxviii. To estimate the extent of urban poverty, the Nairobi food poverty line derived using food item weights in the 1981/82 RHBS and December 1992 prices were used. The urban areas taken for the analysis were Mombasa and Nairobi. The prevalence of urban absolute poverty in 1992 was 29.3% adult equivalents, compared with rural poverty of 47.9%. The results should be cast in light of the methodology used to derive poverty lines which tended to under-estimate food poverty by imposing rural consumption patterns, and only using information on 1992 Nairobi prices. There might also be a slight understatement of computed urban poverty measures compared with rural poverty due to the fact that non-household persons (e.g. beggars and parking boys), who are therefore not captured in the national sample frame, are expected to be more in urban than in rural areas.



THE DEGREE OF INEQUALITY IN KENYA, 1982-1992

xxxxix. The Gini concentration ratio based on adult equivalent expenditure in rural Kenya increased from 0.399 in 1981/82 to 0.488 in 1992. During 1981/82, the consumption-based Gini coefficient was lowest in Nyanza (0.360) and highest in Rift Valley (0.401) and Central (0.408), while in 1992 inequality was highest in Nyanza (0.526) and Rift Valley (0.508) and lowest in Coast (0.436). The consumption-based Gini concentration ratio by adult equivalents for Nairobi and Mombasa combined was 0.453 in 1992. Overall, inequality increased in all provinces during the 1982-92 decade. One should be careful not to mix expenditure-based and income-based inequality measures in inter-temporal comparison, as expenditure-based Gini ratios tend to show lower inequality due to under-reporting of income and the fact that expenditure as proportion of income tend to decline as income rises i.e. decrease in the marginal propensity to consume. The overall Gini ratio in 1981/82 based on household income was 0.501, with the greatest inequality within Rift Valley (0.548) and lowest in Coast (0.408).



KENYA: POVERTY PROFILES, 1982-92

INTRODUCTION

1. Kenya has, by African standards, a fairly developed statistical base on macroeconomic accounts. But there is no recent direct statistical evidence on poverty and the trend in the distribution of household incomes¹. The latest estimates (see *World Development Report 1989*) are for 1976, arising from a series of surveys undertaken within the framework of the Integrated Rural Surveys 1 (1974/75), 2 (1976), 3 (1977) and 4 (1978)². Data on urban household incomes was collected in 1974/75 (*Nairobi Household Budget Survey*, unpublished). The source of data on rural household incomes and consumption patterns was IRS1, as the later IRS cycles did not collect data on income and consumption. Within the Integrated National Sample Survey Programmes, the Central Bureau of Statistics (CBS) undertook three Child Nutrition Surveys (in 1977, 1978 and 1982) to assess the nutritional status of children. The economic and social data collected within the IRS frame, the child nutrition surveys and the 1979 population census provided a factual and fertile basis for the preparation of the report on *Situation Analysis of Children and Women in Kenya* (CBS and UNICEF, 1984b, 4 volumes.). The database spurred academic debate on the status of rural and urban household incomes and distribution of land in Kenya.

2. Apart from an analysis of urban household income distribution by the ILO Mission to Kenya (1972), (which was based on data from the *Urban Household Budget Survey 1968-69*), the references on the extent of poverty and inequality have been using database set up within the IRS framework. In the 1980s, CBS undertook five major surveys on land assets, rural and urban household incomes and consumption patterns, and nutritional indicators:

- (a) The Rural Household Budget Survey 1981/82, covering 27 strata/32 districts. The detailed results have never been published, and only highly aggregated information was released as Chapter 3 of *Economic Survey 1988*.
- (b) The Urban Household Budget Survey 1982/83, whose basic objectives were to provide basic information on the incomes and patterns of consumption of different socio-economic groups, and to provide weights on which to base revision of the cost of living index.
- (c) The Agricultural Production Survey 1986/87, which covered 24 districts mostly in high and medium potential areas, the results of which were published in capsule form in *Economic Survey*

¹. See Judith Heyer, *Kenya: Monitoring Living Conditions and Consumption Patterns*, United Nations Research Institute for Social Development (UNRISD), Geneva, 1990, for insights on the status of surveys on living conditions undertaken in Kenya in the last two decades.

². The data used by the United Nations and the World Bank, based on 1976 estimates, were dropped in the *World Development Report 1990* for being out of date. The World Bank did not indicate the source of its database on Kenya's income distribution.

1989.

- (d) Two child nutrition surveys have been undertaken -- urban (1983) and rural (1987).
- (e) The National Welfare Monitoring Survey was conducted during November/December 1992, and summary results were published in *Economic Survey 1993*.

3. The most recent indicators of rural incomes and consumption patterns were derived from the Rural Household Budget Survey 1981/82 (RHBS), which covers almost the whole country except North Eastern Province and Samburu, Turkana and Isiolo districts. The Central Bureau of Statistics conducted a household budget survey in Nairobi in 1974, whose results have been analyzed extensively and used as a proxy for urban income distribution in Kenya (see, for example, Vandemoortele, 1982, 1987; and Vandemoortele and der Hoeven, 1982). The latest urban household budget survey was conducted during 1982/83 and covered 34 urban areas grouped into seven strata but only Nairobi, Mombasa, Thika, Nakuru, Eldoret and Kisumu were self-representing towns.

4. During the 1980s, there has been very little analysis of poverty and equity issues. The purpose of this study is to fill the gaps by updating the poverty assessment for the period 1982-92 using the 1981/82 Rural Household Budget Survey, 1982/83 Urban Household Budget Survey (UHBS), and the Welfare Monitoring Survey (WMS1) undertaken in December 1992. However, the 1982/83 UHBS database could not be used since the original data was not available. The database provided was in very aggregated form, did not include key variables on household characteristics e.g. household members' age, educational characteristics (except the household size) and expenditure on key food items, mainly maize and bread. It was therefore not incorporated in the analysis.

5. To make meaningful comparisons with previous studies based on the 1974/75 IRS data, the methodology used follows that of the principal analysts of the IRS database, namely Foster, Greer and Thorbecke. Their seminal work on Kenya pioneered a mode of analysis which had far-reaching theoretical advancements, in addition to its application on poverty assessment of Kenya's smallholder sector.

6. The study is divided into four main parts. First, the study gives a brief account of the methodology used to define and categorize the poor, mainly the derivation of the poverty line. The second section describes the survey design and data collection methodologies of the 1981/82 RHBS and the 1992 WMS1, including an assessment of the quality of data collected and/or available. The third section deals with the derivation of the poverty lines used in the study. Finally, poverty profiles covering the period 1982-92 were constructed, focusing mainly on the rural poverty due to lack of an appropriate urban base-period database for 1982.

DIMENSIONS OF THE PROBLEM

7. Kenya's patterns of spatial and size distribution of income and opportunities has its roots in the imperial policies of the colonial era, the cultural heritage, differences in land potential, and Government's policies and programs since independence. During the colonial era, Asians dominated trade while Europeans controlled cash crop farming, giving rise to racial inequality, as empirically demonstrated by Bigsten (1987, 1988) and graphically reflected in contemporary urban residence patterns in Kenya. The racial segregation in land use denied Africans land titles, thereby generating rural landlessness and spontaneous urban settlements (slums).

8. European settlers' cash crop farming was based on low cost indigenous labour, reinforced by hut taxes which forced African men into the wage economy. Colonial administration offered wage employment opportunities to men and influenced traditional kin-group ownership of land by registering land in the names of individual males. Individual control of land gave men access to credit using land as collateral, and denied women traditional use and access to credit. The subsequent pattern of migration left women in subsistence farming, giving rural women the conjugal role Abbott (1974; 1976) aptly described as "full-time farmers and weekend wives". In the coastal area, gender differences are embedded in Muslim conventions such as the sanctions of *purdah* that limit women's residential mobility and require special garments. In the predominantly Christian hinterland, the ultra-poor postpone the day they shall inherit the earth. The poor pass through the eye of the needle into Paradise; the rich remain outside with the camels (Galbraith, 1979).

9. The strong rural-urban ties are through flows of people and wealth. Many urban dwellers were born and raised in the countryside, and invest wage earnings in rural land and send remittances⁴. These characteristics have earned Kenya an important place in the academic literature, for being the seedbed of research on rural-urban migration using the expected income hypothesis (Harris-Todaro model) and the more recent inclusion of risk aversion in the migration theory, and the estimation of remittances function (Johnson and Whitelaw, 1974).

10. As Clark (1985) points out, the conjugal structures in Kenya evades easy data collection and analysis due to biased identification of "households", "heads of households" and "women heads of household". The standard definition of the "household" assumes (a) that the physical boundaries of the household define units of social and economic organization (thereby ignoring economic exchanges between households), and (b) that the household is a basic decision-making unit behaving according to the rule of household utility (thereby ignoring intra-household inequality in resource allocation based on age and gender). It is assumed that "head-of-household" and the primary breadwinner is a male, while women rather than men are socially recognized as primary providers for their children through their

³. This section is largely based on M.H. Clark, *Household Economic Strategies and Support Networks of the Poor in Kenya: A Literature Review*, Water Supply and Urban Development Department, World Bank, Washington, D.C., July 1985.

⁴. Affiliation to one's cultural group, and the group's access to state resources, adds a political dimension to regional income inequality.

efforts in subsistence agriculture. Frequently, woman-headed households⁵ are identified on the basis of the absence of a male spouse in the household. This study will break down woman-headed households into (a) *de facto* female household heads defined by the temporary but long-term absence of a male spouse in the household; and (b) *de jure* female household heads identified by lack of adult male/spouse in the household. As we shall see later, aggregation of data into a single category of woman-headed households masks the levels of poverty faced by *de jure* woman-headed households. In future poverty studies, it will be necessary to study the structure and dynamics of *de jure* female headed households e.g. sources of income and transfers (so as to understand the differences in entitlement by type of motherhood), expenditure patterns, household size and composition, and ownership of assets.

11. Kenya's cultivatable land constitutes only about 17 per cent of its total area. Rural population densities are exerting pressure on the resource base. It would therefore be revealing if the household budget survey data included agro-ecological zones, in order to meaningfully compare our results with those obtained in previous studies such as those of Greer and Thorbecke (1983; 1986a; 1986b; 1986c). However, in the absence of such information in cluster identification, a crude district-level variable termed "physiological density", measured in persons per high potential land equivalent, will be used as a proxy for resource stress and as an explanatory variable for regional inequalities (see Statistical Appendix Table 1).

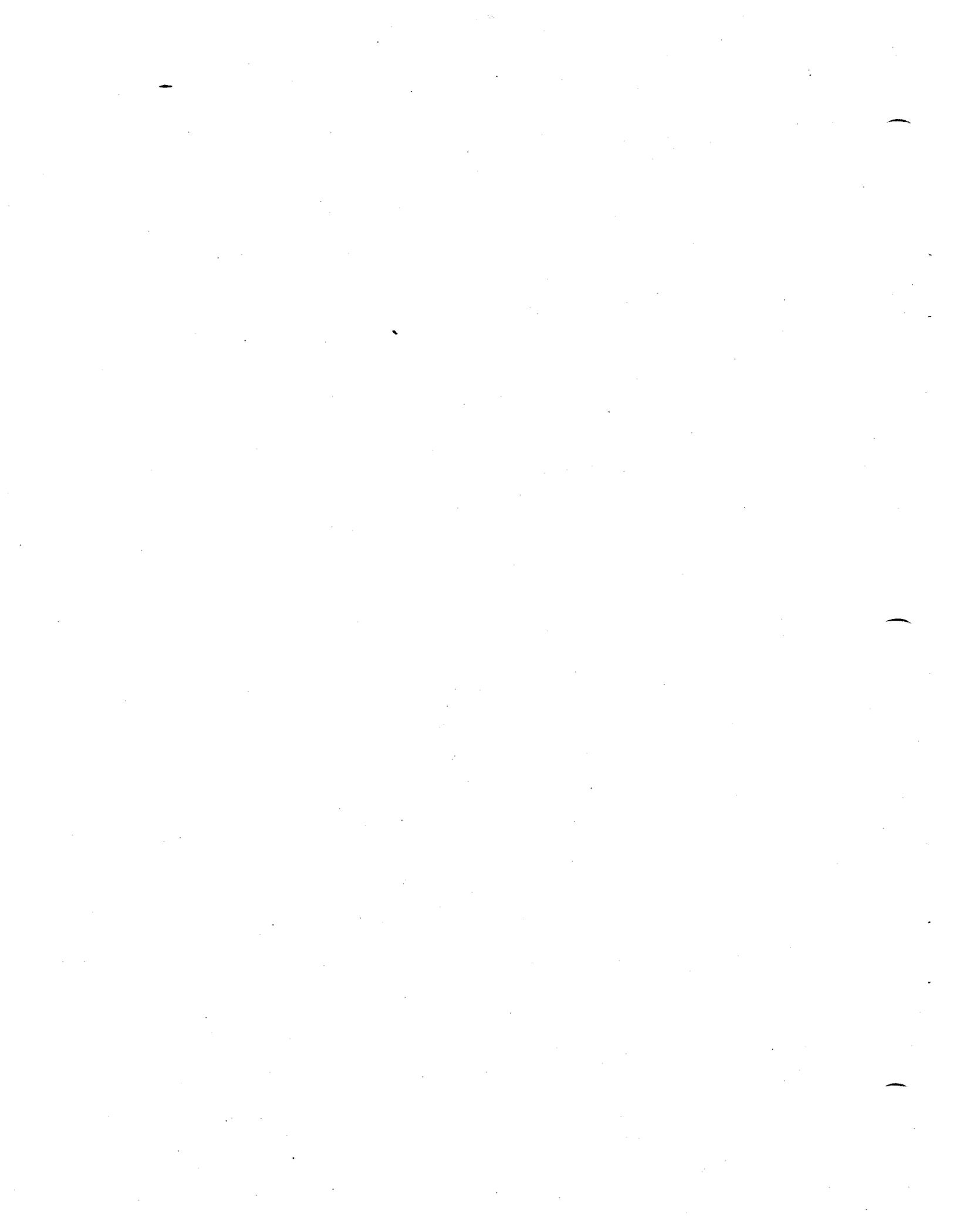
12. However, this measure is crude for a number of reasons. First, the measure masks some exceedingly heavy actual densities within some districts, as well saying little about actual distribution of land (see Anzagi and Bernard, 1977a). Second, the ILO Mission to Kenya (1972) estimated high-potential land equivalents by assuming that 5 hectares of medium-potential land and 100 hectares of low-potential land are equivalent to 1 hectare of high-potential land. As the ILO report stated, "this is admittedly a crude weighting system". Third, the measure of land potential used is rainfall, but does not include soil types and the relative value (prices) of crops grown (or livestock kept), which determines the relative wellbeing of agricultural-based households. There is need to include the agro-ecological zone codes, or an aggregate measure of land potential⁶, within the national sample frame developed by the Central Bureau of Statistics, and for studies to measure changes in population-resource pressure in line with the works of Anzagi and Bernard (1977a, 1977b). The addition of an agro-ecological zone variable identified by main crop grown in an area would have allowed an assessment of how Government's sectoral policies and programs have impacted on household welfare e.g. the state-owned enterprises and other government institutions' management of the coffee and cotton sub-sectors. Cultural diversity in the modes of production, adapted to local and historical conditions (e.g. agro-ecological potential, nearness to lakes and major towns), has also led to spatial income differences based on relative returns to fishing, nomadic pastoralism, hoe farming, cash crop farming, and non-farm sources of income.

⁵. The usual reference to "women-headed households" is not grammatically correct.

⁶. The source of data used by the ILO (1972) is the *Statistical Abstract*, which defines high potential as annual rainfall of 857mm or more (over 980mm in Coast province); medium potential as annual rainfall of 735-857mm (735-980mm in Coast province and 612-857mm in Eastern province); and low potential as annual rainfall of 612mm or less.

13. **Kenya's high population growth** is hindering economic growth and increasing the pressure on good agricultural land. Although the fertility rates are on the decline, the decline has mainly been stimulated by declining household economic fortunes, rather than the envisioned fertility decline with economic growth as contemplated in the standard textbook theory of demographic transition.

14. In summary, the proximate determinants of poverty and inequality are **nature, culture and history**. At a more general level, nature dictates that tropical countries be prone to myriad parasites (e.g. locusts) and tropical diseases e.g. bilharzia, malaria, river blindness, parasitic worms (e.g. roundworms and hookworm), leprosy, and cholera (Kamarck, 1976), and the prevalence of various tropical diseases within Kenya is not evenly distributed. Land holdings are not equally productive, although population pressures in productive areas moderate nature's contribution to regional inequalities. Fertility rates are largely determined by cultural utility of children in general, the relative weights given to boys in the demand function, and risk aversion when children are viewed as security at old age. Gender inequality is deeply embedded in culture and history, and their attendant influence on gender distribution of property rights. Government policies are made within a cultural and historical context, and may not be viewed in the same way by all Kenyans given their diverse cultural and historical experiences.



CONCEPTS AND DEFINITIONS

INTRODUCTION

15. To analyze how the welfare of the poor has changed in a region or country, we need to answer two questions. First, which individuals are poor and who are not? Secondly, how much poverty is there in aggregate? The first question involves defining the poor and the poverty line, while the second question broadly deals with aggregate measures of welfare. Since data is collected at the household level while our unit of analysis is the individual, we have to apply appropriate weights (adult equivalence scales) to individuals in the household on the basis of age and sex to reflect both differences in requirements and the general pattern of intra-household inequalities in expenditure allocation.

POVERTY

16. The definition of poverty used in the analysis is that, with given resources, if a household manages prudently and still finds that it cannot afford the necessary calorie intake, it is considered to be poor (United Nations National Household Survey Capability Programme, 1989). There are two issues of importance embedded in the definition. First, items of consumption other than food will be taken into account. Secondly, if a family does not meet its calorie requirements but has a relatively high income, the household will not be considered poor. This will be done to ensure that, the classification of households by nutrition intake does not obscure results that could be obtained by comparing income, which is the main purpose of the study. The required level of nutrient intake is set at 2250 calories per day for an equivalent adult.

17. The food poverty line can be crudely described as set within utility space, where utility is assumed to be measured in terms of calorie intake. However, the minimum non-food expenditure required can also be taken as measurable within the same utility space, i.e. calorie intake, if we take the non-food items to be the basic needs that ensures that a household, individual or equivalent adult does not need to take more than the required minimum calorie allowance. For example, an individual who does not have the minimum clothing, shelter and medical care would require a higher minimum calorie intake, and the minimum non-food items required at the food poverty line might be more economically acquired than the supplementary food intake required to compensate for lack of, say, clothing and shelter, while food energy can be more effectively increased by raising food-to-energy conversion through reduction in gut parasites i.e. medical care (Lipton, 1988).

POVERTY LINE

18. There are potentially two ways of deriving poverty lines, the absolute and relative methods. An absolute poverty line is fixed over time and space, i.e. over the entire area and period to be covered in the study. The absolute poverty line will be the cost of food expenditure necessary to attain a recommended food intake, and a modest allowance for non-food items (Ravallion, 1992b). The poverty line is used to identify the poor from the non-poor (they will not be described as rich since "rich" is a relative concept). Since Kenya does not have an officially defined absolute poverty line, we shall develop a poverty line to be used in the study.

19. Scott (1981) gives a brief account of the attempts at setting absolute standards of poverty in the 19th and early 20th century. If there are no measurement errors in expenditure or income data, the absolute poverty line was the cost of meeting the basic physiological needs, i.e. food, clothing, rent, fuel, and essential sundries (Scott, 1981). No allowance was made for additional expenditure in the event of sickness, for gambling, alcohol, tobacco, saving for old age or burial. As Rowntree (1901), who was the originator of the absolute poverty line as it is commonly used today, but also its first critic⁷, commented:

A family living upon the scale allowed for in this estimate must never spend a penny on railway fare or omnibus. They must never go into the country unless they walk. They must never purchase a half-penny newspaper or spend money to buy a ticket for a popular concert. They must write no letters to absent children, for they cannot afford to pay the postage. They must never contribute anything to their church or chapel, or give any help to a neighbour which costs them money. They cannot save, nor can they join a sick club or trade union, because they cannot pay the necessary subscriptions. The children must have no pocket money for dolls, marbles or sweets. The father must smoke no tobacco, and must drink no beer. The mother must never buy any pretty clothes for herself or for her children, the character of the family wardrobe, as for the family diet, being governed by the regulation 'nothing must be bought but that which is absolutely necessary for the maintenance of physical health, and what is bought must be of the plainest and most economical description'. Should a child fall ill, it must be attended by the parish doctor; should it die, it must be buried by the parish. Finally, the wage-earner must never be absent from his work for a single day. (Rowntree, 1901; cited in Scott, 1981).

20. As George Orwell argued in his 1936 novel, *The Road to Wigan Pier*, some households defined as absolute poor did not necessarily spend their income on the items specified in the theoretical minimum nutritionally optimum diet, thereby leading to "physical degeneracy which you can study directly, by using your eyes, or inferentially by having a look at the vital statistics". As we shall see later, households that can afford the minimum consumption basket but do not do so due to "abnormal" expenditures on, say, sickness, gambling, beer, tobacco, burial, etc, will be considered as non-poor.

21. A relative poverty line is set at a constant proportion of the national mean income or the median. "Relative definitions of poverty explicitly allow the poverty threshold to be dependent on the community one is studying, based on the notion that poverty is a situation in which one cannot take part in the ordinary way of life of the community one is living in" (Zaidi and de Vos, 1993). As Ravallion (1992b) observes, the notion of an absolute poverty line -- which does not vary with changes in living standards -- appear to be relevant to low income countries like Kenya, while relative poverty is more relevant to high income countries. Although it is more appropriate to use the concept of absolute poverty in the Kenya case, the conceptual and data problems in computing a justifiable absolute poverty line makes it imperative to analyze the survey data using both relative and absolute poverty concepts.

22. Poverty can change in one region over time due to changes in either inequality or economic growth. The major problem with the use of relative poverty indicators is that they do not disentangle notions of poverty and economic growth. For example, if per capita income in Kenya increased due to economic growth during the reference period 1982-92, a

⁷. Rowntree was also the first to develop inter-temporal poverty profiles, for 1899 and 1936.

poverty line based on a proportion of the mean income will not be comparing households or individuals facing the same living standards. If relative poverty was the sole policy parameter, it would lead anti-poverty policy towards redistributive welfare programs rather than economic growth since relative poverty can be eradicated through redistribution alone. Despite the shortcomings of the relativist approach, the study will use five poverty lines: (a) a relative poverty line set at 66 per cent of mean consumption expenditure to define the "poor"; (b) a relative poverty line that cuts the households into two equal parts, i.e. the median and therefore prejudices the extent of poverty, (c) a relative poverty line set at 33 per cent of mean consumption expenditure to define the "hard-core poor" or "ultra-poor"; (d) an absolute food poverty line based on minimum energy requirements, and (e) an absolute hard core definition of poverty which assumes that a household whose total expenditure is not sufficient to meet its food requirements is "ultra-poor". The relative poverty lines used in this study, other than the median, follow those of Ghana (Boateng *et al*, 1990).

REGIONAL PRICE DEFLATORS

23. One important step in spatial and inter-temporal comparison of monetized variables is to inflate (deflate) raw data in order to bring all values to a common denominator (e.g. Nairobi, December 1982=100). The first step in inflating or deflating a time series is to obtain a consumer price index to measure the price of a "market basket of goods". In this study, the problem will be complicated by (a) the adequacy and reliability of price data generated by the Central Bureau of Statistics, and (b) the lack of a robust theoretical methodology of deriving spatial differences in the cost of living. In order to compare the 1981/82 Rural Household Budget Survey and 1992 Welfare Monitoring Survey, provincial price deflators will be applied to adjust household consumption expenditure levels for regional price variations.

EQUIVALENCE SCALES

24. Although survey data is collected at the household level, the interest is usually on the individual consumption (welfare), which is not observed directly. Since expenditure (and food consumption) levels differ by age and sex, the household data has to be adjusted to take account of the demographic factors before a meaningful comparison of household welfare is undertaken. This is done by the use of adult equivalence scales, which take into account (a) economies of scale in household consumption and (b) the existence of child goods in contrast to adult goods. Theoretically, the adult equivalence scales used in analysis of "food poverty" can be defined along the minimum food requirements developed by Food and Agriculture Organization (FAO) and the World Health Organization (WHO), which classifies energy requirements by age and sex. However, in actual practice, intra-household distribution of resources is unlikely to follow normative standards as set out by international organizations.

25. The equivalence scale designed by OECD in 1982 implies that for every additional adult, a household needs 0.7 times the resources of the first adult (denoting economies of scale in household consumption) and for all children younger than 14 years, it needs 0.5 times the resources of the first adult (OECD, 1982, cited in Zaidi and de Vos, 1993). The World Bank (1990b) recommends adult equivalent scale of 0.2 (<7 years), 0.3 (7-12 years), 0.5 (13-17 years) and 1.0 (> 18 years). The World Bank scale appear to give very low values

to individuals in the range of 7 to 17 years. Since child goods are usually the target of subsidies and public services provided by Governments and non-governmental organizations (e.g. subsidized education, health, school feeding programmes, etc.), removal of subsidies and reduction in expenditure (or deterioration of public services) in the social sectors shifts the burden on to the families, thus raising the adult equivalent ratio for the beneficiaries in the age cohorts. This also implies that child costs differ between urban and rural areas due to the costs of education and health services brought about by prevalence of private schools and hospitals in the urban areas. The spatial and inter-temporal nature of equivalence scales should ideally be determined empirically.

26. The earlier studies on poverty in Kenya (see Greer and Thorbecke, 1986a, 1986b, 1986c) used equivalence scales developed by Anzagi and Bernard (1977a). The adult equivalence scales developed by Anzagi and Bernard (1977a) covers age groups of 0-4 (weighted as 0.24), 5-14 (weighted as 0.65), and ages 15 and above (weighted as 1.0). During the intervening period, 1976-1992, changes in relative costs of child to adult goods have taken place due to price liberalization and reduction in subsidies which are mainly targeted at child goods. In addition, the child costs of children below 4 years (who are not in school) may have increased in urban areas due to reliance on private medical facilities, while those of school age may be higher due to reduction in subsidies to Government schools and increased reliance on private provision of educational services. These factors imply a higher differentiation between rural and urban equivalence scales and less steep scales overall than the ones developed by Anzagi and Bernard (1977a). However, the adult equivalence scales developed by Anzagi and Bernard will be used in this study to generate adult equivalent expenditures from the 1981/82 Rural Household Budget Survey and the 1992 Welfare Monitoring Survey, to make our results comparable with previous studies which utilized the same equivalence scales.

MEASURES OF POVERTY

27. The degree of poverty will depend on the *incidence* of poverty (numbers in the total population below the poverty line), the *intensity* of poverty (the extent to which the incomes of the poor lie below the poverty line), and the degree of *inequality* among the poor. In addition to reflecting the three dimensions, a poverty index should also be decomposable among sectors and socio-economic groups (World Bank, 1990b). A summary measure which meets the four requirements is that of Foster, Greer, and Thorbecke (1984), commonly known as the FGT measure. If real expenditures or income (or calorie intake, in case of food poverty) are ranked as follows:

$$Y_1 \leq Y_2 \leq \dots \leq Y_q < z < Y_{q+1} \leq \dots \leq Y_n$$

where $z > 0$ is the poverty line, n is the total population, and q is the number of poor, the FGT index is a weighted, normalized sum of expenditure shortfalls of the poor population:

$$P_\alpha = (1/n) \sum [(z - Y_j)/z]^\alpha; \alpha \geq 0.$$

Essentially, the poverty measure takes the proportional shortfall of income for each poor

person $[(z - Y_i)/z]$, raises it to a power (α) – the "poverty aversion" parameter – which reflects societies' concern about the depth of poverty, takes the sum of these over all poor households, and normalizes by the population size (Ravallion, 1992b; Boateng *et al*, 1990).

28. The parameter α is a policy parameter that reflects concern for the poor; as α increases greater weight is attached to the poverty gap of the poorest. The main measures in this study are (a) the "head-count index" ($\alpha=0$), which measures the prevalence of poverty and is insensitive to how far below the poverty line each poor unit is; (b) the "income-gap ratio" ($\alpha=1$), the average of the poverty gaps expressed as a fraction of the poverty line; and (c) $\alpha=2$, which gives the severity of poverty and produces the coefficient of variation of expenditure distribution of the poor. The head-count index (H) simply shows the proportion of the people below the poverty line. However, the income-gap ratio (HI) takes into account both the incidence of poverty (H) and its intensity (I). The sum of the poverty gaps is the total income required to eliminate poverty. The income-gap ratio is insensitive to income distribution among the poor.

$$\text{where } I = (1/q)\Sigma[(z - Y_i)/z]$$

29. Unlike $P_{\alpha=1}$, $P_{\alpha=2}$ is affected by expenditure transfers from one poor household to another. In comparing two populations, the one with the higher inequality in the distribution of the shortfalls $(z - Y)$ will have a higher $P_{\alpha=2}$. The FGT index becomes more and more sensitive to the least disadvantaged as α increases until ($\lim P_{\alpha} = 0$ as $\alpha \rightarrow \infty$), the measure reflects only the poorest household.

30. The FGT index is sub-group decomposable. This means that if we divide the population into mutually exclusive and collectively exhaustive groups indexed by j and if $P_{\alpha j}$ is the poverty in the j th group, then the overall index of poverty

$$P_{\alpha} = \Sigma X_j P_{\alpha j}$$

where X_j is the proportion of total population in group j . The contribution of poverty in group j to national poverty is:

$C_j = (X_j P_{\alpha j})/P_{\alpha}$. The decomposition of national poverty into provincial, district, occupational, agro-ecological zones, or other groups will help in developing a poverty profile for Kenya. Poverty indices (P_{α}) will be calculated for $\alpha = 0, 1, 2$.

MEASURES OF INEQUALITY

31. The measure of inequality used is the Gini coefficient. Suppose there are n families with income $Y_i(1, 2, \dots, n)$

$$\begin{aligned} Y &= (Y_1, Y_2, \dots, Y_n) \geq 0, \\ S_y &= (Y_1 + Y_2 + \dots + Y_n) > 0, \text{ and} \\ y &= (y_1 + y_2 + \dots + y_n) = Y_i/s_1, \dots, Y_n/s_n, \text{ where} \\ y &= (y_1 + y_2 + \dots + y_n) = 1 \text{ and} \\ (Y_1 &\leq Y_2 \leq \dots \leq Y_n). \end{aligned}$$

Note that incomes are arranged in a monotonically non-decreasing order, such that the first household or individual is poorest and the last household is wealthiest. The Gini coefficient is a non-negative fraction that takes on extreme values of 1 to represent extreme inequality and zero to represent extreme equality. In addition, if the incomes of all households (or persons, depending on the unit of analysis used) change by a common multiple, the Gini coefficient will not change.

32. The Gini coefficient of Y is defined as⁸:

$$G_y = \alpha U_y - \beta, \text{ where}$$

$$\alpha = 2/n,$$

$$\beta = (n+1)/n, \text{ and}$$

$$U_y = \phi_1 y_1 + \phi_2 y_2 + \phi_3 y_3 + \dots + \phi_n y_n, \text{ where}$$

$$(y_1 \leq y_2 \leq \dots \leq y_n), \text{ and}$$

$$\phi_1 = 1, \phi_2 = 2, \phi_3 = 3, \dots, \phi_n = n.$$

$$\text{Therefore, } G_y = (2/n)U_y - (n+1)/n = (1/n)[2U_y - n + 1]$$

ϕ_i is the income rank of the i family, and U_y is the weighted average of income ranks, commonly referred to as the rank index of Y. Since many statistical packages do not have in-built (menu-driven) algorithms for calculating the Gini coefficient, the circuitous technique is to rank-order the data in an ascending order, and compute the value of U_y using the ranks and the re-ordered income or expenditure data.

33. To compare changes in poverty between two points in time (comparative statics) regardless of the poverty line used, we use the concept of stochastic dominance developed by Atkinson in the context of measurement of inequality (Atkinson, 1970) and measurement of poverty (Atkinson, 1987) and summarized by Ravallion (1992b). The income or consumption data from the household budget surveys used in the poverty profiles are first reflatd (or deflated) to a single point in time for ease of comparison of real values. In the case of measures of inequality, the first order dominance between the initial and terminal distributions simply states that the Lorenz curve of one distribution lies inside the other for all levels of real income. In the case of poverty measurement, first order dominance is useful in determining whether there is more poverty in one region than the other or in the region or country over two points in time regardless of the poverty line used. The analysis treats the poverty line as a random variable that is allowed to change from the minimum to a maximum.

⁸. See Fei, *et al* (1979), pp. 330-331.

BACKGROUND ON THE REQUISITE HOUSEHOLD BUDGET SURVEYS

RURAL HOUSEHOLD BUDGET SURVEY, 1981/82

SURVEY TECHNIQUES

Introduction

34. The principal objectives of the 1981/82 Rural Household Budget Survey (RHBS) were:

- i) To provide comparative data on the levels of income and consumption in rural Kenya;
- ii) To obtain information on sources of cash and in-kind income for households of different economic, social and demographic characteristics.
- iii) To ascertain consumption habits and patterns and provide consumption data for the revision of the Rural Consumer Price Index.
- iv) To obtain information on the relationship between household size, the housing and social amenities at its disposal and the expenditures on such amenities.
- v) To obtain information on the relationship between occupation and employment status and level of income and expenditure.
- vi) To supplement the sources used in the compilation of official estimates of income, expenditure and savings for the household sector of the National Accounts.

Sample Design

35. The RHBS utilized the multi-stage NASSEP II frame. The sample of households was obtained through the selection of Primary Sampling Units (PSUs) from the 1979 Population Census, followed by the selection of clusters and finally the households within a cluster. Each cluster had about 100 households from which a 10 per cent sample was selected for interview. In all, 648 clusters were selected which contained more than 69,000 households, or about 2.8 per cent of the rural population. The sample was stratified by district or groups of districts. Overall, 27 strata were formed and 24 Enumeration Area (EAs) were selected from each strata. North-Eastern province and the northern districts of Rift Valley (Turkana and Samburu) and Eastern province (Marsabit and Isiolo) were excluded. The exclusions comprised 54 per cent of the total land area and 5 per cent of the national population. The following sparsely populated contiguous districts were merged to form common strata: Kilifi/Tana River/Lamu, Baringo/Laikipia, Narok/Kajiado and West Pokot/Elgeyo Marakwet. The rest of the districts were covered separately as distinct strata. The RHBS had wide

geographic coverage and a sample size large enough to permit the estimation of district level variables. A nation-wide picture of household income and expenditure was supposed to be obtained by combining the data with that obtained from the 1982/83 Urban Household Budget Survey (UHBS).

Survey Organization

36. To reduce the bias due to seasonal variability, the survey covered one year. The 24 clusters in each stratum were randomly divided into three equal sub-samples. Those assigned to the first sub-sample were interviewed in cycles 1, 4, 7, 10 and 13; the second sub-sample were interviewed on cycles 2, 5, 8, 11, 14; while the third sub-sample were enumerated on cycles 3, 6, 9, 12, 15. The questionnaires were divided into 4 recall categories based on the expected frequency of the household transactions. These were: baseline information which included household composition, dwelling characteristics and household assets (completed at the start of the survey), weekly recall, monthly recall, and quarterly recall period. A calendar showing when each questionnaire was to be filled was attached to the enumerators' manual. The survey was conducted over 15 cycles of 28 days each, allowing each household to be enumerated over a one year period, from June 1981 to July/August 1982.

37. Non-response was not a serious problem. There were three categories of non-response: not at home (structure not abandoned); refused to be interviewed; and vacant (structure abandoned). The most common type of non-response was household not found at home. Women whose husbands work away from home would be at home during the listing but might have joined their husbands by the time the survey started. There was a case where a road construction workers camp was selected in West Pokot. After a few months of interviewing, the camp was moved to an inaccessible area. Refusals were rare. Substitution for non-response was done at the start of the survey but thereafter no replacements were allowed.

RHBS Coverage and Response

38. Only 640 clusters were listed, 8 being dropped for administrative reasons. The 640 clusters contained 6,852 households, distributed by strata. The count of households was based on computerized selection of households. The lists of households forwarded to supervisors were inevitably modified in the field and the number of households actually covered by the enumerators was about 6,400.

39. Response from all the 6,400 households was not received. It is the number of households which submitted questionnaires that were subsequently processed. This confusion was caused by misunderstanding of coding and administrative instructions. Instructions were that a questionnaire should be processed for the households even though a household refused, was vacant, not at home or did not have relevant information. In the early stages of the survey, this was not consistently followed. Non-coverage (the difference between the number of households listed and the number covered) was accounted for by either the failure to locate certain households or the field supervisor's decision to eliminate certain households from a cluster. The latter occurred when there were too many households for the enumerator to cover and in effect a re-selection at the cluster (EA) level took place.

40. Unfortunately, overall survey response could not be easily determined due to the one year survey implementation utilizing multiple visits to the same household. Non-response increased as the survey progressed. The increase in non-response was associated with increase in vacant households rather than refusals or absent respondents. At the end of the survey, non-response was about 10 per cent. Weights were adjusted to compensate for non-response and vacant households. The 1982 Rural Household Budget Survey database used for this report consisted of 5,839 households since it excluded 162 households with adult equivalent expenditures below Shs 30 per month (see Text Table 1 below).

Text Table 1: Rural Household Budget Survey, 1981/82 Sample Size

COAST RURAL	618
Kilifi, Tana & Lamu	182
Kwale	214
Taita Taveta	222
EASTERN RURAL	864
Machakos	241
Kitui	204
Meru	233
Embu	186
CENTRAL RURAL	1,149
Nyeri	236
Murang'a	218
Kirinyaga	253
Kiambu	212
Nyandarua	230
RIFT VALLEY RURAL	1,692
Nakuru	202
Nandi	250
Kajiado, Narok	179
Kericho	238
Uasin Gishu	215
Trans Nzoia	218
Baringo, Laikipia	188
W. Pokot/Elgeyo M.	202
NYANZA RURAL	892
South Nyanza	248
Kisii	198
Kisumu	219
Siaya	227
WESTERN RURAL	624
Kakamega	235
Bungoma	192
Busia	197
TOTAL RURAL	5,839

Data Processing

41. Data from the questionnaires were transcribed onto coding sheets. This was done to facilitate data entry, standardize units of consumption, and clarify potential misunderstandings that could arise due to questionnaire design. Except for RHBS-1 (household composition) and RHBS-2 (housing and amenities), all questionnaire forms were transcribed. This coding phase was a weakness in the questionnaire design and one of the causes of delays in data processing.

42. There were a number of data processing problems. First, the number and complexity of the questionnaires. Initially, questionnaires were forwarded to the field without being suitable for data entry. This imposed the additional step of transcription and coding. Second, the size of the sample and the sample design complicated data processing tasks e.g. varying coverage by cycle and varying recall periods by questionnaire type. The size of the survey generated heaps of forms which had to be carefully controlled to avoid data loss or misplacement. Third, data processing advice at the survey's conception was inadequate. Processing time was greatly underestimated and the availability of both machine time and equipment was limited. Finally, according to Opondo (1988), the specific procedures for valuation of own-produce consumed was not developed. "Little is therefore known about the underlying retail prices used to impute values of own-produce consumed" (Opondo, 1988). Although a lot of time was devoted to planning for RHBS, one step was completely missed out in the survey design: no analysis plan was ever developed till after field work was at an advanced stage.

43. Missing data is defined as data that were collected from the field but were not reflected in the completed data file. Whenever missing records were thought to occur, a trace on batches delivered from the field to headquarters was initiated. These searches usually proved fruitless. A final estimate of the percentage of missing records by record type was made. The findings suggest that missing records would cause an under-count of between 2 to 4 percent on all cyclical questionnaires. This should be borne in mind when interpreting these data.

Estimation and Sampling Errors

44. The objective of the RHBS was to obtain reliable household income and expenditure estimates at the strata level. The general formula for estimating a total characteristic Y in a strata S is given by Kish (1965):

$$Y_s = r_s \left(\sum^h W_{hi} \sum^m Y_{hij} \right)$$

where Y_{hij} is the value of the variable in the j^{th} PSU (cluster) and h^{th} strata;

W_{hi} is the sample weight for households in cluster i strata h i.e. is the household selection probability times the PSU (cluster) selection probability;

n_i is the average number of households responding over the cycles of the survey;

I_h is the number of clusters within strata h ; and

r_i is a strata level ratio adjustment factor equivalent to the 1979 census rural population projected to 1981 divided by the weighted estimate of population from the survey.

Standardizing Recall Periods

45. The RHBS used different recall periods for various categories of income, expenditure and consumption. A recall period of 7 days was used to collect information on farm labour and on regular expenditures for food and household items. A 4-week recall period was used for expenditures on durables and on income from employment, self-employment, cash receipts, and transfers. A 3-month recall was used to elicit information on sales of household inventory, purchase of agricultural inputs and crop and livestock production. The data collected had therefore to be standardized to a uniform recall period of one year. The collection of data took place over 15 4-week cycles, each sub-sample enumerated over 13 cycles with a staggered start. Each household was "in" the sample for 5 of the 13 cycles.

46. These different recall periods were adjusted so that each data item collected with recall had the recall period adjusted to estimate one year. To achieve this, weekly and 4-weekly recall were multiplied by 2.6 to yield a total recall of 52 weeks. Questions eliciting 3-month recall already covered 52 weeks recall period and were not adjusted. All income and expenditure variables were divided by 12 to provide average monthly estimates of income and expenditure.

Sampling Error

47. The results from a sample survey are affected by two types of errors: non-sampling errors and sampling errors. A non-sampling error is due to mistakes made in carrying out field activities, such as failure to locate and interview the correct household, errors in the way questions are asked, misunderstanding of the questions on the part of either the interviewer or the respondent, data entry errors, computational errors, etc.

48. The sample used for the RHBS is only one of many samples that could have been selected from the same population, using the same design and expected size. Each one would have yielded results that differed somewhat from the actual sample selected. The sampling error is a measure of the variability between all possible samples. Sampling error is usually measured in terms of the "standard error" of a particular statistic (mean, percentage, etc.), which is the square root of the variance. The standard error can be used to calculate confidence intervals with which one can be reasonably assured that, apart from non-sampling errors, the true value of the variable for the whole population falls.

49. As explained above the RHBS was not a simple random sample. The survey design depended on stratification, stages and clusters. Because of this a more complex formula was developed to calculate sampling error. When individual strata are examined, the 95%

confidence interval becomes much broader. If the number of households having the attribute is small then the confidence interval can become quite broad and it can be seen that confidence intervals overlap when comparing one strata with another. This means that it cannot be said with certainty that the value of own produce consumed in, say, Kitui of Ksh.170.90 is different from the mean value in, say, Uasin Gishu of 191.61.

50. Individual record types were summed together to the household level. For example, regular expenditure records were summarized into selected expenditure categories. The summarized categories were then adjusted to reflect a standard one-year recall period. This summarization process covered all the different record types and resulted in one long record for each household. During the summarizing process, the sample survey weights, non-response adjustments and agro-ecological zone codes were added to the data.

COMMENTS ON THE 1981/82 RURAL HOUSEHOLD BUDGET SURVEY DATA

51. The data files made available to the consultant was not the original data entered from the questionnaires, but data aggregated or truncated by systems analysts⁹. In the case of household composition, data aggregation problems related to age of household members, relation of household members to household head, and occupation of the head of the household.

52. Exact information on the age of individual household members was not available since it was aggregated to number of members per household per specified age group by sex. The differentiated age groups, classified also by sex included 0-4 years, 5-9, 10-14, 15-19, 20-29, 30-39, 40-49, and 50 and above. The age categories in the aggregated data permitted the use of adult equivalence scales developed by Anzagi and Bernard (1977a) which requires age groups of 0-4, 5-14, and ages 15 and above. However, in an estimated 8 per cent of the cases, the household size derived by summing up household members by age groups was different from that of summing up using relation to household head ("daughters", "sons", and "other relatives"), thus distorting mean incomes, mean expenditures, and adult equivalence ratios, etc. The errors appear to be in the age categories – used in deriving adult equivalents – with about 1 per cent of the households having household members as much as ten times the numbers derived by summing up "relation to head". The variable on the "number of persons in the household" used the total derived from the aggregated age categories.

53. The legend of the codes for occupation of the household head were not availed to the consultant, making it difficult to generate meaningful socio-economic groupings. Under each "occupation of the household head", e.g. professional, technical class, there were different codes (numbers) rather than a single code as would be expected. A frequency count of occupation of the household head under each occupation category did not give a lead on the meaning of the codes (numbers) in the aggregated database. The occupation codes in the database do not tally with those of the Kenya National Occupational Classification System (KNOCS) used in the 1981/82 Rural Household Budget Survey and which was adapted from the International Labour Office's (ILO) International Standard Classification of Occupations (ISCO-1968). For example, agricultural, forestry and related workers not working on their

⁹. See Harvey Herr, *Consultancy for Transfer of a Sub-set of the RHBS Data from Mainframe to Microcomputer for use in Development of Poverty Profiles*, Ministry of Planning and National Development, July 1992.

holdings (KNOCS category 55) is shown to represent 74 per cent of all household heads who responded to the survey questionnaires, although the figure probably represents all agricultural workers working on and outside of their holdings. It appears that further instructions on coding the occupation of household head were issued to enumerators and/or data coding clerks, but copies of such instructions were not filed. This put a binding constraint on the use of the 1981/82 Rural Household Budget Survey database, since it was initially envisaged that poverty measurements and interpretations would be meaningful with socio-economic groupings based on occupation of the household head.

PROCEDURES FOR DETERMINING INCOME AND EXPENDITURE¹⁰

54. *INCOME*

1. Household farm enterprise

- 1.1. Gross farm cash income
 - 1.1.1. Cash gross income from crops
 - 1.1.1.1. Crop sales (HBS-10)
 - 1.1.2. Cash gross income from livestock
 - 1.1.2.1. Livestock sales (HBS-10)
 - 1.1.2.2. Hides sold (HBS-10)
 - 1.1.3. Cash gross income from milk
 - 1.1.3.1. Sales to KCC (HBS-7)
 - 1.1.3.2. Sales to ... etc (HBS-7)
 - 1.1.4. Cash gross income from eggs
 - 1.1.4.1. Sales to ... etc (HBS-7)
- 1.2. Farm enterprise cash expenses
 - 1.2.1. Agricultural inputs
 - 1.2.1.1. Expenditure on fertilizer, sprays (HBS-9F)
 - 1.2.1.2. Expenditure on vet. supplies and services (HBS-9F)
 - 1.2.1.3. Expenditure on livestock feed (HBS-9F)
 - 1.2.1.4. Expenditure on other ag. inputs (HBS-9F)
 - 1.2.1.5. Purchase of farm equipment (HBS-9F)
 - 1.2.1.6. Wages paid for hired labour (HBS-9F)
 - 1.2.2. Livestock purchase (HBS-10)
- 1.3. Net cash income from farm enterprise (1.1 less 1.2)
- 1.4. Gross farm income in kind
 - 1.4.1. Gross income in kind from crops
 - 1.4.1.1. Value of other crop disposals (HBS-10)
 - 1.4.1.2. Value of crop gifts received (HBS-6)
 - 1.4.1.3. Value of own consumption (HBS-6)
 - 1.4.2. Gross income in-kind from livestock

¹⁰. This is based on notes by R.J. Pember, International Labour Office and United Nations Economic Commission for Africa regional adviser in household surveys, Nairobi, Central Bureau of Statistics, October 1987.

- 1.4.2.1. Value of other livestock disposals (HBS-10)
- 1.4.2.2. Value of livestock consumed (HBS-10)
- 1.4.2.3. Value of gifts received (HBS-10)
- 1.4.2.4. Value of wool and mohair, etc (HBS-10)
- 1.4.3. Gross income in-kind from milk
 - 1.4.3.1. Value of milk consumed (HBS-7)
 - 1.4.3.2. Value of other disposal (HBS-7)
- 1.4.4. Gross income in-kind from eggs
 - 1.4.4.1. Value of eggs consumed (HBS-7)
 - 1.4.4.2. Value of other disposal (HBS-7)

1.5. Farm expenses in kind¹¹
 Crops, livestock etc given as gifts or wages
 Crops fed to livestock or used as seed, etc

1.6. Total net farm income (cash and kind) (1.3 + 1.4 - 1.5)

2. Household non-farm enterprise

- 2.1. Gross non-farm enterprise cash income
 - 2.1.1. Cash gross income from self-employment
 - 2.1.1.1. Cash sales from self-employment (HBS-8)
 - 2.1.1.2. Cash revenues from self-employment services (HBS-8)
 - 2.1.1.3. Other cash self-employment earnings (HBS-8)
 - 2.1.2. Cash gross income from employer enterprise
 - 2.1.2.1. Revenue to enterprise from sales (HBS-8)
 - 2.1.2.2. Revenue to enterprise from services (HBS-8)
 - 2.1.2.3. Other employer revenue (HBS-8)
- 2.2. Non-farm enterprise cash expenses
 - 2.2.1. Wages paid
 - 2.2.2. Utilities paid
 - 2.2.3. Licenses, etc, paid
 - 2.2.4. Other cash business expenses
- 2.3. Net cash income from non-farm enterprise (2.1 less 2.2)
- 2.4. Gross non-farm income in kind
 - 2.4.1. Gross income in kind from self-employment
 - 2.4.1.1. In-kind sales from self-employment (HBS-8)
 - 2.4.1.2. In-kind revenue from self-employment services (HBS-8)
 - 2.4.1.3. Other in-kind self-employment earnings (HBS-8)
- 2.5. Non-farm enterprise expenses in kind

¹¹ Consumption of own produce should not be shown as expense because it should eventually form part of the net household income out of which consumption is made.

- 2.5.1. Wages paid in kind
- 2.5.2. Other business expenses in kind
- 2.6. Total net non-farm income (cash and kind) (2.3 + 2.4 - 2.5)
- 3. Wage and salary income
 - 3.1. Cash wage/salary received (HBS-8)
 - 3.2. In-kind wage/salary received (HBS-8)
 - 3.3. Total wage/salary income received in cash or kind (3.1 + 3.2)
- 4. Income from rents, interest, pensions, etc.
 - 4.1. Producer's cooperative society income (HBS-8)
 - 4.2. Rent received (HBS-8)
 - 4.3. Interest received (HBS-8)
 - 4.4. Dividends received (HBS-8)
 - 4.5. Pensions/NSSF (HBS-8)
 - 4.6. Total cash income from interest, rent, pensions, etc. (4.1+4.2+4.3+4.4+4.5)
- 5. Cash transfers
 - 5.1. Cash transfers in (HBS-8)
 - 5.2. Cash transfers out (HBS-8)
 - 5.3. Net cash transfers (5.1 - 5.2)
- 6. Other cash receipts¹²
 - 6.1. Loans received (HBS-8)
 - 6.2. Revenue from sale of assets (HBS-9)
 - 6.3. Savings withdrawals (HBS-8)
- 7. Total net income (1.6 + 2.6 + 3.3 + 4.6 + 5.3)
- 55. **EXPENSES**

Consumption Expenditure

- 1.1 Food (purchases, own-consumption, gifts) - HBS-6
 - 1.1.1. Bread and cakes
 - 1.1.2. Maize
 - 1.1.3. Other cereals
 - 1.1.4. Meat
 - 1.1.5. Fish
 - 1.1.6. Milk
 - 1.1.7. Eggs
 - 1.1.8. Oils and fats

¹². This group has been excluded from the computation of net income since they are non-regular or capital receipts.

- 1.1.9 Fruits
- 1.1.10 Vegetables
- 1.1.11 Beans
- 1.1.12 Roots
- 1.1.13 Sugar
- 1.1.14 Flavours
- 1.1.15 Other foods
- 1.2. Beverages (soft drinks, beer, spirits) and tobacco - HBS-7
- 1.3. Clothing and footwear - HBS-7
- 1.4. Fuel - HBS-7
- 1.5. Furnishings -HBS-7
- 1.6. Transport and communications¹³ - HBS-7
- 1.7. Non-durable household goods - HBS-7
- 1.8. Purchase of durable household items (HBS-9B)
- 1.9. Payment for services (rates, water, electricity, telephone) - HBS-7
- 1.10. Rent payment¹⁴ - HBS-9C
- 1.11. Health care - HBS-7
- 1.12. Education - HBS-9C
- 1.13. Recreation and entertainment - HBS-7
- 1.14. Miscellaneous goods and services - HBS-7

Non-Consumption Expenditure

- 2.1. Insurance, license- HBS-9C

56. A few clarifications are in order. First, rent is excluded from the analysis, both on the expenditure and income side, since the enumerators were only required to record imputed rent if the cluster was urban. A total of 5,786 households (96.4 per cent) did not respond on the rent variable since the survey was on rural households. Omission of imputed rent component is not a serious source of error in the analysis of a rural household budget survey. Second, domestic services are not included as an income item since it was combined with non-durable household goods expenditure in the aggregated database. However, the error from this source might be negligible since the use of paid domestic services is largely an urban phenomenon.

57. $P_{\alpha=1,2}$ i.e. depth and severity of poverty statistics are very sensitive to low or zero values in the income (or expenditure if used as surrogate for income). It is therefore necessary to clean the data to exclude cases with zero or unrealistically low expenditure values. In the case of the 1981/82 Rural Household Budget Survey, 162 out of 6,001 households were dropped by assuming that the minimum permissible adult equivalent

¹³. This excludes purchase of transport equipment since the data collected on motorcycles, bicycles and cars did not specify whether they were for household or commercial use. In addition, the aggregated database combined all expenditure on transport equipment including lorries, vans, trailers and boat into one variable.

¹⁴. Rent data will be excluded from the analysis since no distinction was made between domestic rent and business rent when collecting the data. Dwelling tenancy status (renter, owner-occupied, etc.) was also not collected and no attempt was made to impute the rent of owner-occupied dwellings in this survey. Cash receipts (rent) was lumped up with producer cooperative society income, interest, dividends, loans, and savings withdrawals, and will therefore not be included in net income.

expenditure was Shs 1 per day (Shs 30 per month). Care should be taken to ensure that measured depth and severity of poverty is real, as it can be created by poor data edit specifications and missing data for some components of expenditure.

THE NATIONAL WELFARE MONITORING SURVEY, 1992

SURVEY TECHNIQUES

58. Within the World Bank lexicon, the National Welfare Monitoring Survey (WMS1) was a priority survey whose main objectives are usually the identification of policy target groups and the production of key socio-economic indicators describing the wellbeing of different groups¹⁵. The primary purpose of the Welfare Monitoring Survey was to gauge the present and future net socio-economic consequences of structural adjustment in Kenya. The specific objectives were:

- (a) To establish an information system that will provide timely indicators on living standards for different regions and socio-economic groups;
- (b) To monitor changes in living standards, particularly of the vulnerable segments of the population; and
- (c) To develop Government's in-house analytical capability to relate changes in living standards to national policies and programs.

59. The Welfare Monitoring Survey is a national sample survey based on NASSEP III frame. It is a collaborative effort between the Ministry of Planning and National Development's Central Bureau of Statistics (CBS) and Human Resources and Social Services Department, with financial support from the World Bank. WMS1 collected data during November and December 1992 in 44 districts in the republic, excluding Turkana, Marsabit and Samburu, using four sets of questionnaires to be filled during the same interview or in subsequent visits to households. Data from North Eastern province was obtained from urban clusters only, and its results do not therefore represent rural areas of the province. The questionnaires were intended to capture information on the following welfare subjects: household composition; household expenditures; household incomes; assets, amenities owned and availed to the households; and land utilization.

60. As can be seen from Text Table 2 below, the number of rural households analyzed in 1992 (6,325) was only slightly above that of 1982 (5,839), despite the increase in population of over 30 per cent during 1982-92. The number of responding households was higher than those analyzed due to discarding of households which did not have complete data. The ratio of analyzed to sampled households was below 50 per cent in Nakuru (45.64 per cent), Kisumu (42.55 per cent) and Mombasa urban (47.80 per cent). Since non-responding households and households with incomplete data did not necessarily observe identical income/expenditure distributions as those that were analyzed, the deviation of the computed

¹⁵. See Central Bureau of Statistics, *Economic Survey 1993* for a brief presentation of the results of data from the 1992 National Welfare Monitoring Survey.

poverty statistics to the "true" measures could be influenced by this source of error.

Text Table 2: Welfare Monitoring Survey, 1992 Response Rates (%)

	Sampled	Analyzed	Response (%)
COAST RURAL	1,090	677	62.11
Kilifi	300	186	62.00
Kwale/T. Taveta	510	339	66.47
Lamu/Tana River	280	152	54.29
EASTERN RURAL	1,450	961	66.28
Embu	280	152	54.29
Kitui	320	239	74.69
Machakos/Makueni	450	298	66.22
Meru/Tharaka	400	272	68.00
CENTRAL RURAL	1,680	1,061	63.15
Kiambu	470	280	59.57
Kirinyaga	240	141	58.75
Murang'a	370	257	69.46
Nyandarua	240	189	78.75
Nyeri	360	194	53.89
RIFT VALLEY RURAL	3,080	1,793	58.21
Kajiado/Narok	420	247	58.81
Kericho/Bomet	360	244	67.78
Laikipia	230	175	76.09
Nakuru	390	178	45.64
Nandi	340	258	75.88
Baringo	240	182	75.83
E. Marakwet	250	186	74.40
Trans Nzoia/Uasin Gishu	620	175	28.23
W. Pokot	230	148	64.35
NYANZA RURAL	1,870	1,117	59.73
Kisii	360	244	67.78
Kisumu	550	234	42.55
Siaya	360	250	69.44
Homa Bay/Migori	360	228	63.33
Nyamira	240	161	67.08
WESTERN RURAL	1,090	716	65.69
Bungoma	420	267	63.57
Busia	260	183	70.38
Kakamega/Vihiga	410	266	64.88
TOTAL RURAL	10,260	6,325	61.65
Nairobi	1,190	847	71.18
Mombasa	500	239	47.80
TOTAL URBAN	1,690	1,086	64.26
NATIONAL	11,950	7,411	62.02

COMMENTS ON THE DESIGN OF THE WELFARE MONITORING SURVEY, 1992

61. The following comments on the design and the conceptual issues relating to the National Welfare Monitoring Survey (WMS1), 1992, do not necessarily imply that the analysis based on the data is invalid. The comments have primarily been spurred by the fact that the 1992 WMS1 was the first in a series of future surveys. There is therefore need for analysts to recommend desirable changes or clarifications in definitions to ensure that different enumerators understand the questions in the same way. In general, the enumerators' reference manual was brief, and it is difficult to know whether the trainers clarified the issues to the enumerators during training. The comments will, however, be based on the printed enumerators' reference manual.

Household Characteristics

62. Under relationship to head of the household, there are two pertinent comments. First, "child" does not indicate whether the child is a visitor, in which case the child would either fall under "other relative" or "no relation". It is, however, unlikely that the Central Bureau of Statistics field enumerators, given their track record in collecting household-based survey data, would include children who are not offsprings of the household head under "child". It is, however, necessary to be explicit in the enumerators' reference manual. In addition, the option of "domestic servant" was not included.

63. Although the information on the main economic status should have been useful in generating meaningful socio-economic characteristics, the codes used in the questionnaire might have been confusing to the enumerators. The main economic status was defined in relation to "time spent per day on the activity", rather than the main source of income as is ordinarily the case. Time spent per day is ordinarily defined in relation to "main occupation" rather than "economic status". It is possible for the main occupation to differ from main economic status, e.g. a non-paid full-time preacher (occupation) dependent on farming (economic status) for his livelihood. There might also have been confusion between "export-oriented", "cash crop", "food/subsistence farmers" and "pastoralists". First, the farmer might not know whether his/her crop is exported if it is a cash crop, due to the fact that most export crops are also consumed locally. Food/subsistence farmer was defined as a "person engaged in the production of food crops for home consumption" while a "pastoralist" was defined as a "person engaged in animal husbandry". In a number of cases, rural communities are engaged in both food production for local consumption and animal husbandry, in addition to the fact that "pastoralism" is not normally defined in the sense used in WMS1, but also includes the concept of temporally (seasonal or in response to drought conditions) or permanent mobility of the household or some household members and the livestock in search of better pastures.

64. Since information on the main economic status covered all household members, it is not immediately apparent how household employees (not necessarily domestic servants) were treated. Since a household employee might own land e.g. in his own home, the responses might give misleading indication of landlessness. In addition, the enumerators' reference manual did not specify whether household members of a landed household who are 10 years of age and above would be treated as landless or not. The "main economic status" variable could also not be used to distinguish between employees and those working on own-account,

i.e. "self-employed", in various sectors.

65. Codes (legend) for memberships in farmers/women groups were not included in the enumerators' reference manual although they were included in the notes on the training of enumerators.

66. Main economic status refers to all persons 10 years and above, while "worked in the last seven days" was for all members aged 15 and above. The reference age should be similar. In the case of school attendance, one of the options is "pre-school", while the question was supposed to be answered for all persons aged six years and above. It is not immediately apparent how the information on pre-school children who are below six years of age was treated.

Household Expenditure

67. Information on food purchases were not itemized but were collected under the following categories: maize and its products; other cereals and their products; vegetables, fruits and pulses; meat, chicken and fish; dairy products e.g. milk, ghee; sugar; oils and fats; roots; other foodstuffs; and beverages and tobacco. The information collected did not include quantities purchased, and no community-based price surveys were included in the survey to allow for derivation of quantities. It is therefore not feasible to determine calorie availability from the food expenditure data in the Welfare Monitoring Survey. It is also not feasible to compute itemized food expenditure since consumption from own-production is not itemized. The estimate of total food expenditure will exclude food gifts-in since they are grouped with other in-kind and cash gifts. The grouping of gifts-in-kind with cash transfers implies an understatement of consumption. The data deficiency in terms of itemized food expenditures made it impossible to analyze the (expenditure) consumption patterns of the poor in meaningful detail.

68. Examples of cooking fuel are given as paraffin, gas, firewood and charcoal. Since electricity is included under "utilities", the questionnaire did not capture information on the cooking fuel for those households which use electricity.

69. In the category of "education expenditure", it should have been clarified in the enumerators' reference manual that "Harambee" (self-help) should only include Parents-Teachers Association (PTA) Development Fund, which is a fixed development fund decided by PTA, whose collection is enforced in the same manner as other regular school dues. It should not include voluntary harambee or educational support or contribution to students outside of one's household. The latter should be included under "transfers". School uniforms are counted as part of education expenditure, although they are normally included in clothing and footwear since school children would still require to dress even if they were not attending school. This is, however, an insignificant point since school uniforms are itemized separately and re-grouping of data is therefore possible.

70. The house rent for owner-occupiers is treated as both expenditure (the imputed value of rent) and income (imputed if it is not included in the salary for paid-employees). However, the enumerators' reference manual does not clarify that house rent should only be imputed as income if it is not included in the reported salary. The enumerators' reference

manual does not cross-reference issues. For example, while the manual specifies that **recreation and entertainment** does not include alcohol taken in recreation centres, the section on **beverages and tobacco** does not specify that alcohol consumed in recreational centres is included in the latter.

Household Income

71. Crops sold, consumed and in stock covered both the long and short seasons. All information on crops sold, consumed and in stock gave only up to four options. If there were more than four crops, the enumerator calculated totals for the remaining crops and added these to those for the last crop entered, taking care to maintain the same units of measure. The unit of measurement could be kilograms, debe¹⁶, tin, bag, actual count, bunch or heap. Price per unit applies to the market price of that food crop at that particular time for the unit you have given e.g. the price of one debe. Units sold applies to the total number of the specified units sold i.e. if the household sold a 90 kg. bag you enter "090". If nothing was sold, the enumerators were instructed to leave the space for "units sold" blank, thereby making it difficult to distinguish zeros from non-response. The names of the crops were supposed to be put in the space after the titles "crop 1", "crop 2", etc, but this instruction was not consistently followed by the enumerators.

72. There are two general comments relating to crop income. First, the crops were not identified by name, and it is therefore not possible to compute total household consumption of, say, maize and its products, since information on maize purchases is available but itemized consumption of own-produce is not. Food gifts-in was also not separated from other "transfers", making it difficult to identify food consumption for a household heavily dependent on gifts and food relief. In addition, price per unit applied to the market price of that food crop at that particular time for the unit given e.g. the price of one debe of maize. Since the quantities were not converted to a common measure e.g. kilograms, it should have been difficult to edit the data for some non-standard units of measure.

73. The enumerators' reference manual did not emphasize that wages for paid employment should include employer-provided food, clothing, subsidized or free medical care, transport, etc. Income from wage/salary employment includes payments to owner-occupiers, while "rents last month" also counts payments to owner-occupies as income, thereby double-counting the income source. However, it is not possible to drop "rents last month" from income analysis since it also includes all receipts from renting of residential/business premises and land. In the case of self-employment, the manual did not clarify that income should include in-kind income e.g. withdrawal of goods and services from the household enterprise for household consumption.

74. In the case of agricultural income, the costs of inputs to livestock production are not itemized. However, since inputs to food and cash crop production are itemized, "other agricultural expenses" are assumed to refer to costs of livestock production. This increases the margin of error in estimating individual components of agricultural income (food crops, cash crops, livestock income), while leading to a fair estimation of total agricultural income.

¹⁶. Debe is a Swahili word for a 20-litre can used as a measure for the sale of grains and pulses.

However, one omission in the data on agricultural incomes is the absence of costs of hired labour, which will lead to gross exaggeration of agricultural incomes, especially for cash crops. The lack of specificity in the enumerators' reference manual on whether costs of hired labour were collected in the survey, and the difficulty of allocating total agricultural income by source (cash/export crops, food crops, livestock income) made it difficult to differentiate types of farmers in socio-economic grouping.

75. According to United Nations System of National Accounts (SNA) and Provisional Guidelines on Statistics of Distribution of Income, Consumption and Accumulation of Households (commonly referred to as Income Distribution Guidelines, IDG), domestic servants are treated as producers of services. Therefore, wages to domestic servants are counted as consumption expenditure and if a domestic servant is a member of the household, the wages should be included in household income.

76. Since the section on "main job" refer to paid employment for household head and/or spouse, it is expected that the item "domestic work" refers to employment in other households, which is not a widespread phenomenon for household heads. Under employment status, legends "own" and "employer" should have the same meaning, although they are presented as mutually exclusive options. In addition, when the legends for "main job", "type of industry" and "employment status" are interpreted jointly, some string codes can not be meaningfully read.

Assets, Amenities, Land Utilization

77. The main source of water now and distance to water source now solicits information for both "wet" and "dry" seasons, which is confusing to respondents because the data collection period can not be two seasons at the same time. The enumerators' reference manual does not state the difference between V.I.P. (Very Important Persons) and W.C. (Water Closet) toilets under "type of toilet".

78. The questionnaire puts the analytical burden of the survey data on the respondents and enumerators. As stated above, the enumerator or the respondent should not be left to determine what is an export crop, principally because (a) the export crops are also consumed locally and/or (b) the respondent may not know whether his/her cash crop is ultimately exported. This relates also to the "area under other exports" in Assets, Amenities and Land Utilization section of the questionnaire.

PROCEDURES FOR DETERMINING INCOME AND EXPENDITURE

79. The following definitions will be used in classifying income and expenditure:

Household Income. Is the sum of money income and income in kind and consists of receipts which, as a rule, are of a recurring nature and accrue to the household or to individual members of the household regularly at annual or more frequent intervals. (Source: ILO)

Consumption. Indicates all goods and services (or "items") that are used, acquired or purchased not for business purposes and not for accumulation of wealth. (Source:

ILO)

Household Consumption Expenditure. Refers to all money expenditure by the household and individual members on goods intended for consumption and expenditure on services, plus the value of goods and services received as income in kind and consumed by the household or individual members of the household. Thus the value of items produced by the household and utilized in its own consumption, the net rental value of owner-occupied housing and the gross rental value of free housing occupied by the household represent part of household consumption expenditure. (Source: ILO)

Household non-consumption expenditure. Includes income tax and other direct taxes, pension and social security contributions and assimilated insurance premiums, remittances, gifts and similar transfers by the household as a whole and its individual members. (Source: ILO)

80. *Household Income*

Income from paid employment¹⁷

- Basic wages and salaries, including house allowance (cash) – gross and taxes paid
- Subsidized/free employer-provided housing

Income from self-employment

Cash transfers in

- Cash transfers in
- In-kind transfers in
- Pensions/NSSF/annuities received

Other cash receipts

- Loans received

Other incomes, etc

- Rents received (imputed value of owner-occupier, other buildings, and land)
- Interest received
- Dividends received
- Salaries to domestic employees

Income from agriculture

Food crops income

Gross income:

Crops 1-4, long season (units sold: price by quantity sold)

Crops 1-4, short season (units sold: price by quantity sold)

¹⁷. Wage incomes of household head and spouse are excluded since they are included in total wage income for the household.

Crops 1-4, long season (units consumed: price by quantity sold)
Crops 1-4, short season (units consumed: price by quantity sold)
Less:
Food crops agricultural inputs (last year)

*Livestock income:*¹⁸

Livestock sales last year
Livestock products last year
Livestock consumed from own produce
Less:
Other expenses (last year), assumed to refer to livestock expenses.

Cash crops:

Gross income (last year)
Cost of cash crop agricultural production (last year)

81. *Household expenditure*

Consumption expenditure

Food

Purchases:

Maize and its products
Other cereals and their products
Vegetables, fruits and pulses
Meat, chicken and fish
Sugar
Oils and fats
Roots
Other foodstuffs

Own consumption:

Livestock consumed from own produce
Crop 1-4, long season (units consumed: price by quantity sold)
Crop 1-4, short season (units consumed: price by quantity sold)

Beverages and tobacco

Clothing and footwear

*Housing (including imputed rent of owner-occupiers and employer provided housing)*¹⁹

Cooking fuel

¹⁸. No livestock expenses were itemized in the questionnaire. Since expenses for cash crop and food production are itemized, "other agricultural expenses" are assumed to refer to costs of livestock production.

¹⁹. Housing is excluded from expenditure in the rural poverty profiles so as to be consistent with the poverty statistics derived using the 1981/82 Rural Household Budget Survey database.

Utilities
Household durables
Transport and communications
Medical care and health services
Education
Recreation and entertainment
Household non-durables
Salaries to domestic employees

Non-consumption expenditure

Life/health/property/other insurance premia
Transfers out
Harambee (excluding education)
Other household expenditures

MACRO-ECONOMIC CONDITIONS DURING THE SURVEY PERIODS

82. The issues of the design of the 1981/82 Rural Household Budget Survey and the 1992 Welfare Monitoring Survey have already been highlighted. The purpose of this section is to briefly evaluate the economic conditions pertaining during the survey periods to judge the extent to which they would affect the quality of the data collected and the comparability of the results.

83. The 1981/82 RHBS expenditure data was item-specific and was collected over a one-year period, compared with the 1992 WMS1 which was collected on a single visit and was on aggregated expenditure categories. The seasonality of income and expenditure, especially in the rural areas, is therefore likely to affect the quality of the 1992 data more than that of 1981/82. Consumption of food from own-production is affected by seasons and food purchases tend to be low during and immediately after harvests (when own-consumption is higher) and vice-versa.

84. The 1992 WMS1 was conducted only a few weeks prior to the Christmas festivities and the first multi-party elections since Independence in 1963. Christmas festival is normally associated with above-average expenditure on some items e.g. luxurious foods and items of clothing and footwear, although this would not have affected the purchase of the above-mentioned items to a large extent since expenditures on the items were analyzed if they referred to "last month". The euphoria of the elections and the apathy or excitement would also affect the responses, but the direction of the bias is indeterminate.

85. A survey design which involves consecutive visits to the same household is said be *bounded* if the recall is based on the period "since my last visit". Under this definition, the reference periods (last week, last month, last year) used in the 1992 WMS were not bounded, which can lead to serious *telescoping (mis-dating) errors*. Telescoping errors are likely to increase with the length of the recall periods. For example, food consumption data was collected for "last week" and "last month", other than for roots and oils and fats which only used "last month". The error from telescoping was probably minimized by using food

expenditure data collected on the basis of "last month".

86. A problematic issue is the comparability of data on food crop consumption from own production with food purchases. The recall period for food crop own consumption was for "long season" and "short season", and both components were added up in the analysis to derive total food crop consumption. The error from the unbounded recall periods described in terms of seasons is likely to be higher than for calendar-defined recall periods e.g. "last week" or "last month".

87. Non-food expenditure items were collected on the basis of either "last month" or "last year". First, it is not apparent whether "last year" referred to 1991 or 1992 as it was not specified for all non-food items other than "education" which was for 1992 calendar year, and different enumerators and respondents might have interpreted the question either way²⁰. Secondly, regardless of the recall period, respondents are likely to have better memory of infrequent but high expenditure items e.g. "education" and "insurance", compared with "transfers".

88. The 1992 WMS1 survey period was characterized by **unstable and rising commodity prices**, which implies that the prevailing prices "last week" and "last month" for the same commodity were different. For example, the increase in the Nairobi lower income consumer price index was 37.5 per cent during the period January-December 1992, compared with about 18 per cent during calendar year 1982. In addition, the price variations by regions during the survey period were high and atypical, mainly due to shortages of key commodities like sugar and maize. This factor complicates the interpretation of shares in consumption of items collected under the different recall periods. However, since non-food items had longer recall periods, one would have expected the relatively high inflation to be reflected in a low non-food share, but the non-food component of consumption expenditure was higher than expected for both rural and urban 1992.

89. The changes in district boundaries and the number of districts during the period 1982-92 has necessitated updating of the national sample frame since districts are supposed to be treated as distinct strata. The creation of a new district entails transfer of some households from a strata to a new strata or to form an independent strata. If a dry area within a predominantly arable region was made an independent strata, the original district might register a spurious improvement in household welfare due to removal of the poorer households. However, the analysis tried to minimize the area-grouping errors by merging some 1992 sampling frame strata to conform with those of 1981/82.

²⁰ It is understood that the enumerators were instructed to interpret "last year" as 1992 calendar year, but the enumerators' reference manual is silent on the appropriate interpretation of the survey period.

EMPIRICAL DETERMINATION OF THE POVERTY LINE

COST-OF-CALORIES INTAKE FUNCTION APPROACH

90. An innovative method of deriving the poverty line developed by Greer and Thorbecke (1986) is the cost of calorie function. Calorie intake is the reference point for nutritional status, as evidence shows that people that fulfil their calorific needs will most likely also satisfy their protein requirements. The raw 1981/82 household budget survey food consumption data was converted to per adult equivalent calorie intake levels using calorie conversion tables (see Statistical Appendix Table 2). Letting X_j represent food expenditure and C_j be calorie consumption, both per adult equivalent, Greer and Thorbecke specified the cost of acquiring a given number of calories.

$$\ln(X) = a + bC.$$

The poverty line Z is the estimated cost of acquiring the required RDA, R .

$$Z = e^{(\alpha + \beta R)},$$

where α and β are the coefficient estimates of a and b , respectively. Food expenditure rather than income or even total expenditure was used because of its greater reliability. However, theoretically, a poverty line including non-food items can be derived using the total expenditure as the independent variable in the cost of calories function. Cost of calories functions were estimated using the following dependent variables: food expenditure per adult equivalent (Text Table 3); total expenditure per adult equivalent (Text Table 4); and non-food expenditure per adult equivalent (Text Table 5).

91. The demand elasticities for calories, e , are calculated as $\beta/2250$, where β is the estimate of b in the equation

$$C = a + b\ln(X), \text{ the Engel curve for calories.}$$

92. There are at least two inherent sources of errors in the cost of calories function and the demand elasticities for calories. First, the *observed* household food expenditure was derived in terms of monetary expenditure. The variables in our computations, the calorie intake and the food expenditure, are therefore *observed* as one variable, which implies that the measurement errors are common to both the calorie availability and food expenditure data. In essence, food expenditure and calorie intake are not independently observed (Bouis and Haddad, 1992). Secondly, as Greer and Thorbecke noted, the use of a fixed food weight-to-calorie factors for the whole country, over time, and over the entire income profile might be inappropriate due to changing food quality and food preparation methods. As income rises, rich families are likely to consume more expensive calories, leading to an upward bias in b calculated from the cost of calories function.

93. Bouis and Haddad (1992) state that household calorie availability has to be adjusted for leakages due to plate waste, loss in cooking and other food preparation, feeding of animals, and feeding non-household members such as guests, hired farm labourers, and

servants. Their results, based on household data from Philippines, shows that food eaten by non-family members as proportion of total food purchases increases with income. A number of recent studies have also questioned the reliability of calorie content as a surrogate for calorie intake. Schiff and Valdes (1990) postulate that nutrient intake is affected by other variables e.g. non-nutrient food attributes (freshness of food products purchased, their cleanliness, their storability or shelf-life, and so forth), privately-provided inputs (time and care to prepare food, including cleaning, cooking, boiling water, and a refrigerator that ensure that food does not get contaminated or spoiled), publicly-provided inputs (sewerage, water, electricity, and nutritional information), and health status which can influence the degree of absorption of nutrients. Schiff and Valdes shows that, as income rises, a larger proportion of food expenditure is spent on non-nutrient food attributes, which therefore questions the use of fixed nutrient-to-food conversion factors over the entire income range. The two studies therefore focus on errors in translating calorie availability to calorie inputs (Bouis and Haddad, 1992), and food consumption into calorie intake (Schiff and Valdes, 1990). In addition, household budget survey data does not normally specify whether quantities consumed were fresh or dry, which makes it difficult to apply the correct food weight-to-calorie conversion factors.

94. Besides measurement errors, the distribution of poverty using calorie availability and total expenditure will be different for two main reasons. First, in line with the United Nations National Household Survey Capability Programme (NHSCP) definition, a household is deemed poor if, prudently managing its budget, cannot even meet its nutritional requirements. Some families or individuals may report food calorie deficit due to consumption of food items of low calorific value e.g. alcohol and soft drinks, and unusually high non-food expenditures e.g. high medical bills in case of sickness. While these families will be counted as food poor, they will be counted as non-poor when total expenditure data is used to identify and determine the extent of poverty. Second, due to decline in food share (Engel's curve) and the tendency to take more expensive calories as income rises, the distribution of welfare by expenditure rankings is steeper than by calories, especially at higher levels of income. Distribution of welfare using calorie intake will concomitantly appear more egalitarian than that derived using food expenditures.

Text Table 3: Food Poverty Line using the Cost of Calories Function

	a	b	Food Poverty Line	R ²
Coast	3.645864	0.000009089573	70.77	0.70000
Eastern	3.733762	0.000009606834	80.02	0.66546
Central	4.394443	0.000003894861	105.36	0.45662
Rift Valley	3.592126	0.000010401160	73.27	0.69155
Nyanza	3.651672	0.000009776763	74.56	0.60875
Western	3.669709	0.000009416228	74.09	0.71435
TOTAL	3.871301	0.000007225609	78.18	0.55647

Text Table 4: Overall Poverty Line using the Cost of Calories Function

	a	b	Overall Poverty Line	R ²
Coast	4.134419	0.000008829447	113.34	0.56184
Eastern	4.189856	0.000009268937	123.41	0.48593
Central	4.861897	0.000004024599	169.62	0.34673
Rift Valley	4.062881	0.000010240730	116.06	0.51610
Nyanza	4.043525	0.000010116650	112.89	0.54041
Western	4.107642	0.000009444310	115.02	0.51028
TOTAL	4.303481	0.000007356572	121.52	0.44734

Text Table 5: Non-Food Poverty Line using the Cost of Calories Function

	a	b	Non-food Poverty Line	R ²
Coast	3.069878	0.000008392240	37.95	0.28775
Eastern	2.996716	0.000008661679	35.92	0.17241
Central	3.677495	0.000004294344	52.85	0.17311
Rift Valley	2.875046	0.000010058100	34.95	0.21653
Nyanza	2.570393	0.000012540310	30.47	0.26648
Western	2.942675	0.000008981922	34.78	0.22211
TOTAL	3.032715	0.000007886719	35.34	0.21920

95. Text Table 6 below shows that, for all provinces and rural Kenya as a whole, the overall poverty line using the cost of calories function exceeds the sum of (a) food and (b) non-food expenditure at food poverty line, computed separately using the same methodology. This can be explained by the fact that the bulk of total expenditure is food expenditure. Indeed, the relatively high explanatory power (R²) of food expenditure variable in the estimation of overall poverty line is due to the fact that the two variables, food and overall expenditure, are highly correlated since food expenditure is a subset of total expenditure. One would therefore be inclined to take the sum of food and non-food expenditure estimated separately as the appropriate overall poverty line to use in the poverty profiles. As would be expected, R² are higher in the determination food poverty line, followed by overall poverty line, and lowest for non-food expenditure poverty line, since food expenditure was used to estimate the independent variable i.e. calorie availability.

Text Table 6: Summary: Cost of calories function, 1981/82

	1	2	3	4	DIFFERENCE	DIFFERENCE (%)
	FOOD	NON-FOOD	SUM	OVERALL		
			(1+2)		(3-2)	
Coast	70.77	37.95	108.72	113.34	4.62	4.25
Eastern	80.02	35.92	115.94	123.41	7.47	6.44
Central	105.36	52.85	158.20	169.62	11.42	7.22
Rift	73.27	34.95	108.23	116.06	7.84	7.24
Nyanza	74.56	30.47	105.03	112.89	7.85	7.48
Western	74.09	34.78	108.87	115.02	6.15	5.65
TOTAL	78.18	35.34	113.52	121.52	7.99	7.04

96. The Central province poverty line using the costs-of-calorie function is rather high (39.6 per cent above the national mean). As shown in Text table 7 below, the most expensive calories in 1981-82 prices in decreasing order were tea/coffee, meat, fish, eggs, vegetables and milk. The high Central province poverty line derived using the costs-of-calories function is explained by the province's consumption of expensive calories, i.e protein sources. For example, among the provinces, Central province allocates relatively high proportions of expenditure to tea/coffee, eggs, and milk. The food items consumed in larger quantities in Central province relative to other provinces are mainly protein sources, and the high poverty line is therefore explained by the fact that the objective function was maximising calories, rather proteins. In addition, the value of R^2 (i.e. the proportion of the variation in calorie intake explained by food expenditure) was lowest in Central province (45.66 per cent), the highest were Western province (71.44 per cent) and Coast (70.00 per cent), compared to the national mean of 55.65 per cent. For this reason, we have sufficient grounds to reject the use of the poverty line for Central province derived using the costs-of-calories function.

Text Table 7: Contribution of Food Items in total Food budget per Adult Equivalent by province, 1981/82 (%)

	All	Coast	Eastern	Central	Rift/V	Nyanza	Western
Bread	2.32	3.14	1.86	2.66	1.45	3.05	2.46
Maize	24.19	33.09	23.52	18.42	26.01	25.68	27.77
Cereals	4.61	4.01	5.42	4.24	3.18	7.06	3.96
Meat	11.10	10.04	8.97	7.95	11.29	15.57	15.14
Fish	2.11	5.93	0.09	0.10	0.48	7.49	3.40
Milk	13.43	4.55	11.62	15.62	21.38	7.03	9.38
Eggs	1.04	0.53	0.80	1.57	1.37	0.50	0.59
Oils and fats	5.69	4.30	5.12	6.72	5.50	5.89	4.55
Fruits	3.74	4.23	5.26	5.48	1.17	2.34	3.06
Vegetables	6.99	11.57	3.18	5.39	6.84	9.09	11.05
Beans	9.31	8.15	20.06	10.83	5.48	2.44	3.85
Roots	5.88	2.97	5.26	10.08	4.47	4.53	3.51
Sugar	8.15	6.16	6.89	7.97	8.93	8.39	9.39
Tea/coffee	2.14	1.29	1.95	2.96	2.46	0.94	1.89
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Text Table 7 (continued):

Memorandum Items

	Price/calories (Shs/thousand calories)
Bread	1.825
Maize	0.538
Cereals	0.815
Meat	6.860
Fish	5.830
Milk	4.130
Eggs	5.630
Oils and fats	1.850
Fruits	3.460
Vegetables	5.600
Beans	1.610
Roots	1.780
Sugar	1.450
Tea/coffee	79.420

Source: Item consumption weights are based on the 1981/82 Rural Household Budget Survey. The price/per thousand calories are based on national average prices.

97. The demand elasticities for calories with respect to food expenditure at the poverty line were estimated as $b/2250$, where b is estimated from the equation (the Engel's curve for calories):

$$C = a + b \ln(X),$$

where C is calorie availability per adult equivalent, X is total food expenditure per adult equivalent, and 2250 is the required daily allowance (RDA) of calories. As can be seen from Text Table 8 below, the demand elasticities for calories at poverty line exceeded one, except for Nyanza (0.9224) and Rift Valley (0.9850) provinces. The expected elasticities would be less than one, demonstrating a shift to high cost calories as food expenditure rises. However, the anomalous results can be explained by a number of factors. First, the food groups were few, thereby reducing variations in food weight-to-calorie conversion factors. Second, food items used in the equation excluded items of low food weight-to-calorie conversion factors e.g. beer, whose expenditure would be expected to be relatively higher as expenditure rises. Third, Greer and Thorbecke allowed for food wastage in their computations, which implies higher expenditure per RDA calories. Fourth, the database for 1981/82 Rural Household Budget Survey availed to the consultant seem to have overstated the number of persons in the household in an estimated 8 per cent of the cases, thereby inflating the adult equivalents per household. The latter factor would, however, be expected to lead to lower calorie demand elasticities at the poverty line (downward bias), while the first three factors would be expected to raise the computed elasticities (upward bias).

Text Table 8: Demand Elasticities for Calories with Respect to Food Expenditure

	a	b	b/(2250*30)	R ²
Coast	(259,750.2037)	77,011.55	1.1409	0.70000
Eastern	(233,899.6960)	69,269.37	1.0262	0.66546
Central	(462,160.4614)	117,236.58	1.7368	0.45662
Rift	(215,338.4755)	66,487.81	0.9850	0.69155
Nyanza	(207,906.2296)	62,264.78	0.9224	0.60875
Western	(258,249.8732)	75,863.95	1.1239	0.71435
Total	(266,455.5486)	77,013.91	1.1409	0.55647

LINEAR PROGRAMMING APPROACH

98. The determination of a food poverty line is a classic nutrition problem, where the individual aims to achieve a certain minimum nutrition level at the lowest possible cost. It is modelled as a linear programming problem and solved to obtain the point which minimises the cost of consumption required to achieve the minimum calorific requirements. The implicit assumption in the linear programming approach is that household's economic rationality in the choice of the food consumption basket is solely geared towards maximisation of calorie intake within a given resource base.

99. The objective function for the minimization problem takes the form:

$$\text{Minimise } Z = \sum P_i X_i$$

where

- Z = total cost of the consumption basket.
- P_i = Price per unit of the i_{th} commodity
- X_i = quantity consumed of the i_{th} commodity.
- n = number of commodities in the basket.

This will be minimized subject to the following constraints: (a) $\sum C_i X_i \geq RDA$ (recommended daily allowance), which will determine the minimum calorific intake per day, and (b) $X_i \geq Q_i$,

where

- C_i = calorific content of a unit of commodity i ;
- X_i = quantity consumed of commodity i ; and
- Q_i = the minimum quantity required for commodity i .

100. The quantity constraint ($X_i \geq Q_i$) defines the minimum quantities required for each commodity in basket. For non-staple foods, this minimum quantity can be set at zero, to indicate that an individual may consume some or none of the commodity. A third constraint may be included to set minimum consumption of key nutrients such as proteins, but this is not very significant in the determination of the cost of the minimum basket. The latter

constraint takes the form: $N_i X_i \geq NQ$, where N_i is the nutrient content (for a specific nutrient) in a unit of commodity i and NQ is the required minimum intake of nutrient N . An American economist, George Stigler, in 1945 tried to solve a diet problem without imposing minimum quantities of various food items, i.e. $X_i \geq Q_i$. In the resulting solution, only 9 out of the 77 foods in the simplex solution were present. The minimum cost-diet consisted of beef liver, cabbage, corn meal, evaporated milk, lard, peanut butter, potatoes, spinach, and wheat flour. Stigler, in his comment about the "true minimum cost-diet" said: "No one recommends these diets to anyone, let alone everyone" (Stigler, 1945).

101. However, as is evident from the classical linear programming problem, the only region- or country-specific data used in the derivation of the poverty line is prices, as the other variables (required dietary allowance, calorific content of food, and minimum quantities required for each commodity) are exogenously determined. The classical linear programming (LP) approach may therefore imply consumption patterns that do not correspond to local tastes and preferences, or the local supply of the commodities which might depend on agro-ecological potential (rainfall, soil types, etc), traditions, and technology. An obvious flaw in the LP approach is that, if the regional or national food production pattern was changed to reflect the imputed consumption patterns in the LP solution, this would obviously entail changes in relative prices, as resources are moved to production of food items contrary to laws of regional/national comparative advantage. The price data used as an input into the LP problem would therefore be different from those that would prevail in the LP solution in the real world.

102. An improvement of the classical LP approach was developed by Wasay (1977). Wasay took the existing amounts of calories contributed by each major food item in the budget of low income families from household budget survey data and standard food weight-to-calorie ratios. The percentage of the total calorie intake attributable to each item was then applied to the RDA (2250 calories in our study) to calculate the desired consumption levels of the various food items. Finally, the minimum expenditure on each item was derived using the respective commodity prices. This ensures that the consumption basket corresponds with local consumption and production patterns. Although Wasay used the consumption patterns of the poor, we shall use the entire consumption data for all households, since the survey data is on rural households. It is, however, important to note that the margin error in using the data for all households rather than poor households would be fairly large for urban areas.

103. It is important to recognize that poverty lines in Kenya have previously been estimated using a modified LP approach by Thorbecke and Crawford (1978a, 1978b, 1980). The Thorbecke-Crawford diet consisted of maize and beans in a 70/30 proportion. They derived a poverty line assuming a daily per adult equivalent calorie intake of 2250 calories, and using information available on current prices, food weight-to-calorie conversion factors, and the share of food in total expenditure. However, as Vandemoortele (1982) pointed out, the use of share of non-food in total expenditure assumed linearity rather than a curvilinear relationship between food consumption and total expenditure (or income) as defined in Engel's law for food²¹. This can lead to over-estimation of the non-food share at the food poverty line and consequently the overall poverty line.

²¹. Engel's law postulates an inverse relationship between income and the proportion devoted to food expenditure.

104. Statistical Appendix Table 5 presents the summary results of Kenya's overall and provincial poverty lines using the Wasay method and the cost-of-calories function. In both cases, expenditure on alcoholic beverages are put under non-food. The rural food poverty line in 1981/82 average prices using the Wasay method was Shs 87.90 compared to Shs 78.18 using the cost-of-calories function. One striking feature of the results is that food poverty lines developed using the cost of calories function are lower than those derived using the Wasay method except for Central province.

Text Table 9: Food Poverty Lines by Region Using the Wasay Method, 1982-1992

	December 1981	December 1992
Coast Rural	90.96	409.35
Eastern Rural	86.67	387.32
Central Rural	96.36	455.49
Rift Valley Rural	83.74	401.99
Nyanza Rural	86.42	388.39
Western Rural	84.96	382.19
Total Rural	87.90	404.66
Nairobi/Mombasa		514.25

105. It is apparent that the method of deriving food and overall poverty lines developed by Wasay (1977) depends on good database from a household budget survey. However, there are a number of problems in its usage. First, it assumes common food weight-to-calorie conversion factors for all regions and households, and does not take adequate attention to calorie content of prepared foods. Second, the only argument in the objective function is maximization of calories, whereas its computation includes foods which are protein-intensive. Third, it imposes common food prices in one region, and values consumption of own-produce at market prices rather than production costs, thereby overstating the opportunity cost of own consumption. Its strong point is the fact that it allows for differentiation of standards of living between rural and urban areas by using calorie availability as a common unit of measure of utility from food consumption.

DOUBLE LOGARITHMIC APPROACH ASSUMING FOOD POVERTY LINE IS KNOWN

106. A econometric approach to the determination of the overall poverty line would be to estimate a double-logarithmic Engel's curve of food expenditure per adult equivalent (F) vis-a-vis total expenditure per adult equivalent (Y):

$$\ln(F) = a + b\ln(Y)$$

Total expenditure at poverty line, i.e. overall poverty line including non-food, would then be determined by using the value of F at poverty line (assuming F is already known), and the estimated coefficients of "a" and "b" in the equation. "b" is the income elasticity of food consumption – the slope coefficient – since expenditure is assumed to be a surrogate for

income. Other relationships experimented on were (a) regression of non-food with food as the explanatory variable, and (b) total expenditure with food as the explanatory variable. The detailed results are presented in Statistical Appendix Table 6 and the summary results in Text Table 10 below.

Text Table 10: Summary of Regression Estimations of Poverty Line Assuming Food Line is Known.

RURAL 1981/82						
	1	2	3	4	5	6
	Food	Non-food	Total (1+2)	Y	Y	
Coast	90.96	49.27	140.23	146.99	152.04	3.43
Eastern	86.67	37.98	124.65	132.85	134.07	0.92
Central	96.36	43.72	140.08	150.55	142.11	(5.60)
Rift	83.74	39.48	123.22	131.99	134.13	1.63
Nyanza	86.42	42.25	128.67	136.97	143.68	4.90
Western	84.96	40.21	125.17	132.18	138.22	4.57
TOTAL	87.90	54.35	142.25	138.38	140.11	1.26

RURAL 1992						
	1	2	3	4	5	6
	Food	Non-food	Total (1+2)	Y	Y	
Coast	409.35	215.34	624.69	699.29	738.71	5.64
Eastern	387.32	172.68	560.00	634.84	642.63	1.23
Central	455.49	334.86	790.35	902.12	1,041.56	15.46
Rift	401.99	367.88	769.87	876.25	1,085.56	23.89
Nyanza	388.39	178.52	566.91	668.57	731.19	9.37
Western	382.19	224.19	606.38	676.45	778.52	15.09
TOTAL	404.66	242.15	646.81	746.46	842.91	12.92

URBAN 1992						
	1	2	3	4	5	6
	Food	Non-food	Total (1+2)	Y	Y	
Nairobi	514.25	704.83	1,219.08	1,335.81	1,123.18	(15.92)
Mombasa	514.25	436.22	950.47	1,039.28	931.88	(10.33)
TOTAL	514.25	639.22	1,153.47	1,269.25	1,075.52	(15.26)

- Note:
- (a) Column 1 is the food poverty line derived using the Wassey method.
 - (b) Column 2 is estimated from the functional form $\ln(\text{Non-food}) = a + \ln(\text{Food})$.
 - (c) Column 4 is estimated from the functional form $\ln(Y) = a + \ln(\text{Food})$.
 - (d) Column 5 is estimated from the functional form $\ln(\text{Food}) = a + \ln(Y)$, i.e. is the Engel's curve.
 - (e) Column 6 is the difference between columns 5 and 4 as a percentage of column 4.

107. Statistical Appendix Table 6 shows that income elasticities of food consumption (the slope coefficient in the Engel's estimation) was highest in Nyanza (0.844) and lowest in Central (0.735) during 1981/82, and the pattern was similar in 1992, with a high 0.862 for

Nyanza and a low 0.683 for Central province. In 1992, the elasticities were higher for rural households than for urban households, which was in accordance with general expectations. The 1992 urban income elasticities were close to those based on the 1974/75 Urban Household Budget Survey data. However, our estimates for rural 1981/82 (0.795) and rural 1992 (0.795) are lower than those derived from the IRS data, which were based on consumption and expenditure per capita rather than per adult equivalent (Vandemoortele, 1982).

108. The results show that, for 1981/82 the total expenditure poverty lines derived using the Engel's functional form were higher than those derived by summing up food poverty lines and the estimated non-food expenditures at the food poverty lines. For 1992, the rural poverty lines derived from the Engel estimation were higher than the sum of food and non-food at food poverty lines, while the reverse was true of urban poverty lines.

ESTIMATION OF NON-FOOD SHARE ASSUMING FOOD POVERTY LINE IS KNOWN

109. To determine the overall poverty line, it is necessary to compute the expenditure by the poor on non-food items. For our purposes, non-food expenditure items include beverages (soft drinks and beer) since they are of low nutritional value compared to other food items. The share of non-food in total expenditure of adult equivalent households in the band of -20 and +10 per cent of the food poverty line will be used to determine the non-food expenditure²². The share of non-food of all poor households can not be used in determining the poverty line since we are interested in the expenditure patterns at the poverty line rather than for the entire population of the poor.

110. In the section on Concepts and Definitions, a household was defined as poor if it prudently manages its budget and still finds that it cannot afford the minimum calorie intake. In the case of rural 1982, for example, with a food poverty line of Shs 87.90 and a corresponding prevalence of food poverty of 54.5 per cent, a mean overall adult equivalent expenditure of Shs 130.38 was obtained for the households between 34.5 per cent prevalence of food poverty (20 per cent below; Shs 66.00 food expenditure) and 64.5 per cent (10 per cent above; Shs 102.47). The data were then purged to remove households in the range whose adult equivalent expenditures were above Shs 130.38, giving an overall poverty line, including non-food, of Shs 105.94. The same procedure was followed for rural and urban 1992. Rural 1981/82 and rural 1992 are for adult equivalent expenditures without rent, while urban 1992 is on expenditure including rent (see Text Table 11 below). The non-food share in consumption expenditure was higher in rural 1992 than rural 1982. Therefore, the use of a common non-food share at the poverty line may underestimate poverty in 1992, and consequently affect the comparability of poverty statistics from the 1981/82 RHBS and 1992 WMS1.

111. Two comments are in order. First, the methodology ensures that those households that can afford to meet their food requirements but do not do so due to high non-food share or relatively higher expenditure on expensive calories are excluded from overall poverty.

²². If the food poverty line had, say, 50 per cent of adult equivalent households below it, the non-food share of the households within 30-60 per cent of the food poverty line was taken as the share of non-food at poverty line before purging of expenditure data.

This implies that some food-poor households could get out of food poverty if they re-allocated their expenditures to increase the food share, and to cheaper calories. Food poverty is a direct estimate of malnourished, not poor, because (a) a better-off household can consume less calories than required, and (b) a poor household may not be undernourished if it spent its entire budget on food. Secondly, this method ensures that prevalence of food poverty will, by definition, always be higher than overall poverty.. The difference between the prevalence of food poverty and absolute poverty is the estimate of the population that would meet the required minimum calories if they spent less on non-foods and/or changed their diets to more calorie-intensive foods. Although the methodology gives a small non-food share in total consumption at the poverty line, the food poverty line could have been overestimated by (a) including protein-intensive food items in a function whose objective is maximization of calorie intake given a budget constraint; and (b) imposing food consumption patterns of the whole rural population to the rural poor. The two problems could have been minimized by imposing minimum and maximum expenditure limits for the poor in determining the poor's food consumption basket.

112. In the case of urban food poverty line, urban prices were used and the commodity space was contracted so that urban households were forced to have identical food expenditure patterns as their rural counterparts. One inherent source of error is that, if urban demand and supply were to change to reflect the rural consumption basket, the urban prices would also change. This was due to the lack of an appropriate urban database for the base year (1982) or the final year of the comparison (1992). Although itemized own consumption could not be estimated from the 1992 Welfare Monitoring Survey data, the urban consumption patterns were characterised by an insignificant share of own consumption in total food consumption. However, it was not possible to apply appropriate food weight-to-calorie conversion factors to the 1992 food consumption data due to the generality of the food groupings. This helps to set the boundaries within which the urban poverty statistics should be interpreted and understood.

113. The methodology used gives low poverty lines and may consequently underestimate poverty by a slight margin. However, in a policy-oriented study, the purpose is to focus policy attention to vulnerable regions and socio-economic groups. Estimates of, say, 90 per cent prevalence of poverty at the absolute poverty line may lead to official despair i.e. that it is not possible to reduce or eliminate poverty. In addition, household budget surveys are likely to underestimate or omit minor food items in own consumption. The policy response to zero or 100 per cent prevalence of absolute poverty would be largely the same, i.e. policy actions are either unnecessary (zero prevalence) or futile (100 per cent prevalence). A policy-oriented poverty study should rather err on underestimating prevalence of poverty than vice-versa.

114. Three definitions of absolute poverty will be used: food poverty line on food expenditure, absolute poverty line on total expenditure (with rent for urban 1992, and excluding rent for rural 1981/82 and 1992), and food poverty line on overall expenditure. The application of the latter absolute definition of hard core poverty implies that, if a household cannot meet its minimum calorie requirements even if it allocated all its expenditure on food, that household will be deemed as hard core poor. Three definitions of relative poverty will be used in the analysis: relative poverty line based on two-thirds of the mean, relative hard core poverty based on one-third of the mean, and relative poverty line

based on the median of adult equivalent expenditure. The poverty lines in Text Table 11 will be used in creating poverty profiles for 1981/82 and 1992. Classification of households by poverty groups for the purpose of consumption analysis will use two poverty lines: absolute poverty line and absolute hard core poverty line i.e. whose total consumption is below food poverty line. However, due to the low non-food share at the poverty line, differences in expenditure patterns at the absolute poverty line and absolute hard core poverty line would be rather small.

Text Table 11: Overall Poverty Lines on Purged Adult Equivalent Expenditure per Month.

	RURAL 1982	RURAL 1992	URBAN 1992 (Nairobi and Mombasa)
Mean Expenditure (excluding rent)	171.52	894.64	
Mean Expenditure (including rent)			2591.50
Relative poverty (2/3 of the mean)	114.35	596.43	1,727.66
Hard core poverty (1/3 of the mean)	57.17	298.21	863.83
Median (without rent)	126.07	573.37	1,487.67
Median (with rent)			1,751.27
Food poverty line (Wasay method)	87.90	404.66	514.25
Prevalence of food poverty by households (%)	54.50	64.12	34.40
Cut-off: 20% below	66.00	268.66	362.00
Cut-off: 10% above	102.47	495.25	585.14
Mean overall expenditure			1,486.46
Mean expenditure excluding rent	130.38	658.42	
Purged poverty line: Overall expenditure			1,009.70
Purged poverty line: expenditure without rent	105.94	484.98	
Exchange rate (Shs/US\$)	11.51	36.22	
Purged urban poverty line with rent (\$)			27.88
Purged rural poverty line without rent (\$)	9.21	13.39	

Text Table 12: Mean Adult Equivalent Expenditures by Province, 1982-92

	1 1982	2 1992	Nominal increase(%)	Annual nominal growth rate(%)
Coast	156.50	882.58	463.94	18.88
Eastern	159.66	875.94	448.61	18.56
Central	245.95	1,034.42	320.58	15.45
Rift Valley	162.60	905.23	456.72	18.73
Nyanza	143.25	917.89	540.75	20.41
Western	146.17	684.23	368.12	16.69
Total Rural	171.53	894.64	421.57	17.96

115. The 1981/82 and 1992 rural food poverty lines were developed from the 1981/82 Rural Household Budget Survey database but using the respective period's food price data. The non-food share was computed from the respective period's survey data using identical methodology. Therefore, the absolute poverty lines can be taken as inter-temporal price deflators in imputing the change in rural private household consumption during the period 1982-92. The ratio of rural mean adult equivalent expenditure to the poverty line was 1.619 in 1981/82 and 1.845 in 1992. Based on this reasoning, the increase in real household consumption per adult equivalent was 13.94 per cent for rural Kenya during 1982-92. However, the estimate is conceptually difficult to compare with the national accounts estimates because (a) the national accounts private consumption includes non-household private consumption; and (b) our comparison excludes urban areas since there is no base period (1982) urban database. The growth rates in mean adult equivalent expenditures during 1982-92 shows that Western and Central provinces grew below the rural national average, while the rest of the provinces were above (see Text Table 12).

DERIVATION OF REGIONAL PRICE DEFLATORS

116. Ideally, a community-based price survey module should be undertaken in tandem with a consumption and expenditure survey so as to generate price data for use in validating data on consumption from own-produce. However, for the 1981/82 Rural Household Budget Survey, such price data was either not collected or is currently unavailable.

117. To obtain regional price deflators, we require good data on prices and regional consumption patterns. The food poverty line also requires data on food weight-to-calorie conversion factors. If reliable data are available on food conversion factors and regional prices and consumption patterns, then the difference between the ratios of poverty lines in two regions and the regional price deflators, *ceteris paribus*, reflect one region's relatively efficiency in choosing food items of high nutritional value. However, this is not the description of a strictly mathematical relationship since regional price deflators incorporates regional consumption patterns, which largely determine calorie availability.

118. Data on individual item food expenditures was collected in the 1981/82 RHBS by quantity and value. To be able to convert food item expenditure to calorie intake, we need reliable food weight-to-calorie conversion factors and price data. However, we had the luxury to having three price data sets. First, the 1981/82 RHBS collected data on quantity and value of purchases and sales by item, which was used to derive provincial price averages. The differences in food commodity prices by province were not realistic, and this source was therefore not used (see Statistical Appendix Table 7 for producer prices and Table 8 for purchase prices). It appears that there was negligible edit of the survey data on records of quantities sold and purchased by the responding households. A second source was the rural market price database generated by the Agricultural Statistics Section of the Central Bureau of Statistics (CBS), which covers maize, beans, potatoes, tomatoes, cabbages, sukuma wiki (kale), finger millet, sorghum and bananas. The third source was the database used by Consumer Price Index (CPI) Section of CBS to calculate rural retail price indices. Since the price data maintained by the CPI Section contains more commodities, including non-food items, it was used as the primary source, while the price data from the Agricultural Statistics Section was used to countercheck the correctness of price data for the food items the Agricultural Statistics Section covers.

119. The Central Bureau of Statistics computes quarterly CPI for the lower/middle income groups in six provinces, excluding North-Eastern province which is sparsely populated. The data representing the provinces is collected from specific urban centres as given below:

<u>Province</u>	<u>Urban Centre</u>
Coast	Malindi
Eastern	Machakos, Meru, Embu
Central	Nyeri
Rift Valley	Eldoret
Nyanza	Kisii
Western	Bungoma, Kakamega

120. For provinces like Coast, Central, Rift Valley, and Nyanza, the data may not be representative in that it is collected from one urban centre per province. The "market basket" of goods and services and weighting systems for Nairobi, Mombasa, Kisumu and Nakuru CPI are based on details of expenditures obtained from the 1974 Household Budget Survey for the four towns. The 1970/71 Urban Rural Household Budget Survey of Nyanza Province is used to obtain items and weights for compiling CPI of the provinces. There are eight expenditure groups which are similar to those for Nairobi but excludes (a) rent and (b) recreation, entertainment and education. The 1974 Nairobi Urban Household Budget Survey used a relatively small sample (595 households) and this may not have truly reflected the expenditure patterns for the households in Nairobi. The provincial CPI assume that the consumption patterns are the same for all the provinces, being based on Nyanza survey of 1970/71. For lack of better databases, the prices for Coast were derived as the mean for Malindi and Mombasa; Nyanza are Kisii and Kisumu; and Rift Valley are Nakuru and Eldoret.

121. To develop the regional deflators, the following steps were taken:

- (a) Computed the mean price for each commodity over the periods April-June 1981, July-September 1981, October-December 1981, January-March 1982, April-June 1982, and July-September 1982.
- (b) Normalized the commodity weights so that they could add up to 1.
- (c) Using Nairobi as the reference region, the price relatives (the price of the commodity in Nairobi divided by the price of the item in the region in question) were then calculated for each item in all categories.
- (d) The cost of living deflator for region r , C_{ri} , given the price of item i in region r (P_{ri}), and the price of item i in the reference region, P_{ri} , is given by the formula:

$$\begin{aligned}
 C_{ri} &= \frac{\sum(P_{ri} * Q_{ri})}{\sum(P_{ri} * Q_{ri})} \\
 &= \frac{1}{\sum(S_{ri} * (P_{ri}/P_{ri}))},
 \end{aligned}$$

where S_{ii} is the expenditure share of item i in the households total budget.

The deflators were then used to normalize expenditure data for spatial comparison. The deflators are shown Text Table 13 below.

Text Table 13: Regional Food Price Deflators, 1982-92

	1981/82	1992
Coast	1.026	0.914
Eastern	0.973	0.833
Central	0.963	0.918
Rift Valley	0.959	0.811
Nyanza	0.907	0.783
Western	0.984	0.818
Kisumu	0.974	0.876
Nakuru	1.041	0.870
Mombasa	1.071	0.916
Nairobi	1.000	1.000

Source: Computed on the basis of consumption weights based on the 1974/75 Urban Household Budget Survey (for Nairobi weights) and the 1970/71 Nyanza Household Budget Survey (for all rural provinces).

Note: The deflators are based on food items only due to the difficulty of identifying price of, say, transport or rent due to the lack of unit of measurement.

122. The methodology of computing regional price deflators proposed by the World Bank (see Grootaert, 1993; Grootaert and Kanbur, 1993) does not take into consideration the weights of various expenditure items in total expenditure for the reference region, i.e. the index number formula fails the symmetric treatment of regions test (region reversal test)²³. This implies that the deflators between Central province and Nairobi obtained using Central province as the reference region and using the province's weights differ from those obtained using Nairobi as the reference region and using Nairobi weights. The error is particularly significant when regional price deflators include both rural and urban areas due to different rural-urban consumption patterns, especially the non-food share in total expenditure. The methodology is only applicable if one is considering two regions with identical expenditure patterns. Since expenditure per item is the product of quantity and price, identical expenditure patterns would imply that price differences between two regions are fully compensated for by differences in quantities consumed, i.e. if the average price in Region A is double that of Region B, then the average quantity of the item consumed in Region A would be one-half that of Region B.

123. The problem can be illustrated by comparing regions A and B as shown below:

²³. See Diewert (1987).

Text Table 14: Regional Price Deflators: An Illustration

Expenditure item	Region A		Region B	
	Expenditure share	Its Price	Expenditure share	Its Price
Item 1	0.20	1.00	0.10	1.10
Item 2	0.40	1.50	0.40	2.00
Item 3	0.20	3.00	0.25	3.20
Item 4	0.20	0.50	0.25	0.40

It will be apparent from the example that the regional price deflators will be either 1:0.8876 or 1:0.9378 depending on the region taken as the reference point.

124. However, to use regional price deflators that are meaningful to regional poverty comparisons, it is important to note that the entire effort is aimed at deflating regional household expenditures (or incomes) in order to apply a national poverty line to the deflated monetary values. The deflated data for a province using the national poverty line should give the same proportion of poor in the province as using the province's poverty line on un-deflated data. The process of deriving (regional and national) poverty lines and regional price deflators should therefore be determined simultaneously. A system ought to be developed to generate measures of spatial differences in the cost of living, rather than use price deflators whose theoretical underpinnings are principally from inter-temporal price comparisons.

125. The reported low levels of urban poverty in previous studies may be a statistical illusion emanating from derivation of inappropriate spatial measures of cost of living, i.e. regional differences in the cost of achieving a certain level of utility (welfare). A possible avenue for further research is the possibility of using Fisher's ideal index (expressed as the square root of the product of Laspeyres base year weights and Paasche current year weights index numbers), but assume that the prices and weights for end period in comparative statics refer to reference region in the cross-section analysis²⁴.

$$\text{Fisher's ideal index} = \sqrt{\left\{ \frac{\sum(P_n * Q_n)}{\sum(P_n * Q_n)} \right\} * \left\{ \frac{\sum(P_n * Q_n)}{\sum(P_n * Q_n)} \right\}}$$

However, the star index (since the numeraire region plays a starring role: all regions are compared with it and it alone) lacks invariance to the choice of numeraire region. Different choices for the base region give rise to different bilateral indices. There is a case for more intellectual energy to be spent on the theoretical underpinnings in the derivation of spatial price deflators. In addition, since the poverty lines are developed within utility space (i.e. calorie intake is taken as a crude measure of utility), other parameters used in poverty assessment, e.g. multilateral price indices, should also be developed within utility space.

126. The regional food price deflators for the period 1981/82 showed very little provincial

²⁴. See *Retail Price Comparisons for International Salary Determination*, United Nations, New York, 1971, for an application of the Fisher's ideal.

variations due to (a) the existence of widespread price controls for most food items including rice, maize and maize flour, wheat flour and wheat products, milk and milk products, meat, oils and fats, sugar, tea, salt, drinks and tobacco, charcoal and paraffin; and (b) the use of common commodity weights in the provincial consumption baskets based on the 1970/71 Nyanza Household Budget Survey. Price controls interfere with price data based on manufacturers' opportunity costs due to uniform allocation of transport costs to all consumers regardless of distance from place of production, in addition to being an obstacle in the collection of price data due to sellers' reluctance to reveal "black market" prices to official collectors of price data. The results show that, during 1981/82, rural Coast province was more expensive than Nairobi, which is contrary to expectations since the food consumed in Nairobi is mostly grown in Rift Valley and Central province, and should therefore contain price premiums for transportation and dealers' margins. The food price deflators can not be used for rural-urban cost of living comparisons since the urban non-food share is relatively higher.

THE EXTENT, DEPTH AND SEVERITY OF RURAL POVERTY, 1981/82

ANALYSIS OF RURAL FOOD POVERTY, 1981/82

127. The household data on food expenditure was deflated using deflators in Text Table 13, and food poverty line dateline 1981/82 used to distinguish the poor from the non-poor. However, a national rural food poverty line of Shs 87.90, as opposed to provincial food poverty lines, was applied on food expenditure data for all provinces since it was assumed that the regional price deflators reflected relative spatial differences in costs of achieving a minimum food basket. Statistical Appendix Table 9 shows the extent, the depth and severity of food poverty by adult equivalents and households, at the district (strata) and provincial levels. District-level data should be interpreted with caution due to increase in sampling errors as sample size decreases. It should be remembered that the survey did not include North Eastern province, and its rank in provincial poverty status is therefore not known.

128. During 1981/82, the prevalence of food poor adult equivalents was highest in Nyanza (77.1 per cent), followed by Coast (76.3 per cent), Western (73.3 per cent), Rift Valley (69.6 per cent), Eastern (64.6 per cent) and Central (37.9 per cent). When analyzed on the basis of households, Central, Eastern and Rift Valley retain their ranks, but Coast improves by one step in the provincial ranking due to its relatively higher adult equivalents per household. The national average head-count ratio was 65.5 per cent on the basis of adult equivalents, and 54.5 per cent of households.

129. For $\alpha=1$ (depth of poverty) and $\alpha=2$ (severity poverty), Central province had the lowest depth (10.1 per cent) and severity index (4.1 per cent), while Nyanza province had the highest depth (30.5 per cent) and severity (15.2 per cent), compared with the national averages of 23.4 per (depth of poverty) and 10.9 per cent (severity of poverty). Although the district-level estimates are self-evident from the data, they should be taken as broad orders of magnitude due to sampling errors. The most food-poor districts were Kisii (with prevalence of food poverty of 89.2 per cent), West Pokot/Elgeyo Marakwet stratum (84.2 per cent), Busia (82.8 per cent), Kilifi/Tana River/Lamu stratum (81.3 per cent) and Kitui (80.7 per cent), while the least food-poor districts were Nyeri (27.6 per cent), Kiambu (34.2 per cent) and Murang'a (37.9 per cent).

130. Statistical Appendix Table 9 also shows the percentage contribution of each stratum (district) and province to overall rural food poverty. If all the provinces were equally poor, i.e. with same mean expenditure per adult equivalent, and income distributions were similar, the province's contribution to national poverty would be equal to its population share expressed in equivalent adults. That is, a province whose contribution to a poverty measure ($P_{\alpha=0,1,2}$) is greater than its population share in adult equivalents has a higher respective $P_{\alpha=0,1,2}$ than the national average. The population shares in the Statistical Appendix Tables are in adult equivalents, and not persons or households.

131. The measure of food poverty is likely to be more meaningful on the deflated database since the deflators were derived on the basis of food items only, although the problem of consumption weights used in the derivation of price deflators still remains. However, it

should be noted that a monetary food poverty line does not imply that all the adult equivalents above the poverty line are non-poor or vice-versa, due to household-specific consumption patterns. This implies that households who have the resources to meet their required daily allowance of calories (given their food budget) but use expensive calories will be counted as non-poor. Secondly, some food-poor households which do not manage their budgets prudently by allocating an abnormally high share of budget to non-food will be taken as non-poor when overall expenditure, including non-food, is used as the ranking variable. Thirdly, due to Central province's relative inefficiency in converting monetary values to calories (i.e. consumption of expensive calories), the province's superior position is slightly reduced when analyzed in terms of actual calorie intakes.

132. Text Table 15 below shows the prevalence of calorie deficiency vis-a-vis monetized food poverty. The prevalence of calorie deficiency is the proportion of households or adult equivalents whose calorie availability is below 2250 calories, while monetized food poverty is the proportion below the monetized food poverty line of Shs 87.90. The prevalence of calorie deficiency was lower than monetized food deficiency in Coast, Eastern, Rift Valley and Nyanza, almost identical for Western province, but the order was reversed in the case of Central province. This is due to the application of a common food poverty line to all provinces, while Central province's peculiarity is due to the inclusion of protein-intensive sources in a calorie-based food poverty line. It is important to recognize that the use of constant food weight-to-calorie conversion factors over the entire distribution may overstate calorie intake at higher food consumption levels since the share of non-food attributes and food served to guests and workers increase with income (Schiff and Valdes, 1990; Bouis and Haddad, 1992).

Text Table 15: Regional Prevalence of Calorie Deficiency and Monetary Food Poverty, 1981/82 (%)

	<u>Calorie Poverty</u>		<u>Monetary Food Poverty</u>	
	Adult Equivalents	Households	Adult Equivalents	Households
Coast	71.16	59.61	76.25	63.62
Eastern	62.91	53.24	64.58	54.78
Central	44.04	34.09	37.89	28.69
Rift valley	65.56	53.59	69.63	58.15
Nyanza	73.84	62.39	77.08	64.73
Western	73.09	63.88	73.25	65.07
Total Rural	64.29	53.28	65.53	54.50

133. The estimations of food poverty using food poverty line derived on a modified linear programming approach were made on the basis of the 1974/75 Integrated Rural Surveys (IRS) smallholder database (see Crawford and Thorbecke, 1980). The national prevalence of poverty, i.e. per cent of households below food poverty line, were estimated at 25.3 per cent in 1974/75. The IRS database ranked Coast as most food-poor (48.2 per cent), followed by Western (42.6 per cent), Nyanza (22.1 per cent), Eastern (20.0 per cent), Rift Valley

(19.1 per cent) and Central (18.3 per cent). However, there may be three major points to note in the comparison. First, the IRS database was on the smallholder sector who are likely to meet a relatively higher proportion of their food requirements from consumption of own produce, while the 1981/82 Rural Household Budget Survey database did not target a particular segment of households. Secondly, the sample sizes in the IRS were smaller, for example Coast had 64 responding smallholder households, while Rift Valley had 83, while the entire sample was 1,272 responding households. The sampling errors in the estimations were therefore higher for the IRS database. Thirdly, there could have been real increase in poverty during the period of comparison, in addition to the fact that the 1981/82 period was characterised by political instability (the coup attempt of August 1981), high inflation (22.3 per cent in 1982), and the country was recovering from the effects of the 1979 mild drought.

ANALYSIS OF RURAL POVERTY, 1981/82: ABSOLUTE POVERTY LINE

134. Statistical Appendix Table 10 shows the provincial adult-equivalent percentiles relative to national household deciles. This is done by calculating the income level that cuts, say, 10 per cent of the weighted number households below it, and then using the income level to determine the percentiles of the province's population below the specified income level. The income cut-off points are determined on the basis of households and not adult equivalents, and only the national adult equivalent percentiles are directly comparable with the provincial adult equivalent percentiles. The Table is useful in determining the provinces which are better off or worse off than the national average, and is a crude measure of first-order dominance since it treats the poverty line as a random variable (see Atkinson, 1970, 1987). For example, the Table shows that, at any poverty line over the entire distribution, Central province is better off than the national average, while Coast, Nyanza and Western provinces were worse off in 1981/82 compared with the national average. Eastern province was slightly better off than the national average up to the third decile, but the order is reversed over the rest of the income distribution, showing the relative scarcity of wealthy households in the province. Care should, however, be taken in the interpretation of the percentiles since we do not know the nature of dominance between the deciles, e.g. at 15 per cent.

135. An analytical pitfall to be avoided in preparing the table on regional percentiles relative to national deciles is on whether the national deciles are derived on the basis of households or adult equivalents. The regional percentiles in Statistical Appendix Tables 10 and 11 are in adult equivalents, while the national deciles in Table 10 are by households while Table 11 national deciles are in adult equivalents. The national household deciles are obtained by weighting the data with the normal sample-to-population blowing-up factors while national adult equivalent deciles are obtained by weighting the data with the product of the weights (blowing-up factors) and the adult equivalents per household, i.e. $\text{weight} \times \text{household's adult equivalents}$.

136. The analysis of the extent, depth and severity of poverty was made using the overall poverty line, including non-food, and using total adult equivalent expenditure as a surrogate for income. The summary provincial poverty statistics for 1981/82 using the food poverty line (Shs 87.90), overall absolute poverty line (Shs 105.94), the food poverty line applied on total expenditure (Shs 87.90), the relative poverty lines defining the "poor" (Shs 114.35), the relative "hard core" poor (Shs 57.17), and the median of adult equivalent expenditure (Shs 126.07) are presented in Text Table 16 below. During 1981/82, the head-count ratio poor

adult equivalents (prevalence of absolute poverty) was highest in Nyanza (57.9 per cent), followed by Coast (54.6 per cent), Western (53.8 per cent), Rift Valley (51.1 per cent), Eastern (47.7 per cent), and Central (25.7 per cent). When analyzed on the basis of households, Central (19.1 per cent), Eastern (40.2 per cent) and Rift Valley provinces retain their ranks, but Coast's position deteriorates by one step in the provincial ranking. The national average head-count ratio was 47.9 per cent on the basis of adult equivalents, and 39.5 per cent by households. At the strata level, the districts with the highest prevalence of poverty at absolute poverty line were Kitui (71.3 per cent equivalent adults), Kisii (65.0 per cent), West Pokot/Elgeyo Marakwet (62.5 per cent), Kilifi/Tana River/Lamu stratum (62.1 per cent), Busia (61.5 per cent) and Kericho (60.8 per cent). Three districts of Central province, i.e. Murang'a (19.1 per cent), Nyeri (23.1 per cent) and Kiambu (24.1 per cent) exhibited the lowest prevalence of absolute poverty, with Murang'a being the least poor district in Kenya as of 1981/82, at the national absolute poverty line.

137. For $\alpha=1$ (depth of poverty) and $\alpha=2$ (severity poverty), Central province had the lowest depth (6.7 per cent) and severity (2.7 per cent), while Coast province had the highest depth (18.6 per cent) and severity (8.2 per cent), compared with the national averages of 14.9 per (depth of poverty) and 6.4 per cent (severity of poverty).

138. The data was also analyzed using the food poverty line per equivalent adult as the poverty line to be used on total expenditure. The poverty line was justified as an alternative measure of hard core poverty on the basis that, if total expenditure of a rural household is below its minimum food needs, then that household should be defined as ultra-poor. However, the same definition can not be used in an urban environment since urban non-food needs are relatively large and some are un-avoidable. Statistical Appendix Table 13 shows the poverty statistics on "hard core" poverty defined as those households who would not meet their minimum food requirements even if they allocated all their income on food. During 1981/82, the highest prevalence of rural "hard core" poverty was in Coast (43.9 per cent), followed by Nyanza (40.1 per cent), Western (39.9 per cent), Rift Valley (38.3 per cent), Eastern (33.4 per cent) and Central province (16.0 per cent).

ANALYSIS OF RURAL POVERTY, 1981/82: RELATIVE POVERTY LINES

139. Three relative poverty lines were established:

- (a) at 2/3 of the rural national mean (to define the poor);
- (b) the median of total household expenditure, i.e. has one half of the households below it; and
- (c) at 1/3 of the national mean (as an alternative definition of the "hard core" poor).

140. The relative poverty lines were defined from the 1981/82 Rural Household Budget Survey total expenditure data to be those adult equivalents spending less than Shs 114.35 per month, while the absolute poverty line was estimated at Shs 105.94. It is therefore identical to shifting the poverty line upwards by 7.9 per cent in monetary terms. The provincial distribution of relative poor is shown in Statistical Appendix Table 14. Nyanza was ranked

poorest with 64.8 per cent adult equivalents, followed by Coast (59.8 per cent), Western (57.6 per cent), Rift Valley (55.9 per cent), Eastern (52.7 per cent), and Central (30.4 per cent).

141. Using the median of rural national expenditure per adult equivalent, Nyanza exhibited the highest poverty (69.9 per cent) in 1981/82, followed by Western (64.0 per cent), Coast (63.6 per cent), Rift Valley (61.8 per cent), Eastern (59.7 per cent) and Central (36.1 per cent). It should be noted that the median was derived using the normal sample-to-population blowing up factors (weights) and therefore has 50 per cent of households and not adult equivalents below it.

142. The prevalence of relative hard core poverty, i.e. with expenditure below 1/3 of the national mean, was 11.4 per cent on average, while it was highest in Coast (16.0 per cent), followed by Western (14.9 per cent), Nyanza/Rift Valley (about 13.0 per cent), Eastern (9.7 per cent) and Central province (4.5 per cent). The depth of hard core poverty was highest in Coast (3.3 per cent), Western (3.0 per cent), Nyanza/Rift Valley (2.9 per cent), while the severity of poverty followed the same ranking as depth of poverty.

Text Table 16: Provincial Status of Rural Poverty, 1981/82 (%)

	All	Coast	Eastern	Central	Rift/V	Nyanza	Western
<u>Food poverty line</u>							
Prevalence (ad eq)	65.5	76.3	64.6	37.9	69.6	77.1	73.3
Prevalence (HHs)	54.5	63.6	54.8	28.7	58.2	64.7	65.1
Depth (ad eq)	23.4	29.4	21.6	10.1	25.3	30.5	26.4
Severity (ad eq)	10.9	14.5	9.5	4.1	11.9	15.2	12.3
<u>Absolute poverty line</u>							
Prevalence (ad eq)	47.9	54.6	47.7	25.7	51.1	57.9	53.8
Prevalence (HHs)	39.5	43.6	40.2	19.1	42.8	47.6	48.0
Depth (ad eq)	14.9	18.6	14.0	6.7	16.7	17.9	17.4
Severity (ad eq)	6.4	8.2	5.7	2.7	7.3	7.7	7.6
<u>Absolute Hard core poverty line</u>							
Prevalence (ad eq)	34.5	43.9	33.4	16.0	38.3	40.1	39.9
Prevalence (HHs)	27.7	33.3	27.5	11.8	31.4	32.9	33.9
Depth (ad eq)	9.5	12.2	8.5	3.9	11.0	11.4	11.3
Severity (ad eq)	3.7	4.8	3.2	1.5	4.4	4.5	4.5
<u>Relative poverty line (2/3 of national mean)</u>							
Prevalence (ad eq)	53.0	59.8	52.7	30.4	55.9	64.8	57.6
Prevalence (HHs)	44.3	49.0	44.9	23.3	47.1	53.8	52.7
Depth (ad eq)	17.6	21.4	16.8	8.3	19.4	21.1	20.2
Severity (ad eq)	7.8	9.9	7.1	3.4	8.9	9.3	9.2
<u>Relative poverty line (Median of expenditure)</u>							
Prevalence (ad eq)	58.8	63.6	59.7	36.1	61.8	69.9	64.0
Prevalence (HHs)	50.0	53.4	51.7	28.4	52.9	58.9	59.0
Depth (ad eq)	21.1	25.2	20.5	10.6	23.1	25.5	24.0
Severity (ad eq)	9.8	12.3	9.2	4.4	11.1	11.8	11.5
<u>Relative poverty line (1/3 of national mean)</u>							
Prevalence (ad eq)	11.4	16.0	9.7	4.5	12.9	13.0	14.9
Prevalence (HHs)	8.7	9.9	7.9	2.9	10.7	10.7	11.5
Depth (ad eq)	2.4	3.3	2.1	0.9	2.9	2.9	3.0
Severity (ad eq)	0.7	1.0	0.6	0.3	0.9	0.8	0.9

143. The importance of dominance analysis is illustrated by poverty analysis for Machakos district. The example is given for illustration purposes, since sampling errors at the strata level do not permit firm comparisons of inter-district poverty differences especially at the lower deciles. At absolute poverty line, Machakos' prevalence of poverty was 49.0 per cent and depth of poverty was 11.7 per cent by adult equivalents during 1981/82, compared with the national averages of 47.9 per cent and 14.9 per cent, respectively. This shows that, although Machakos had a higher prevalence of poverty than the national average at the absolute poverty line, the transfer of resources required to bring the poor of Machakos to the absolute poverty line (the product of the depths of poverty, the poverty line used, and the number of poor adult equivalents) would on average be less than the national average. This is because, as the poverty line is adjusted downwards to, say, 1/3 of the national mean, Machakos' relative position in terms of prevalence (3.7 per cent) and depth of poverty (0.5 per cent) appear more favourable than the national averages (11.4 per cent and 2.4 per cent, respectively), depicting relatively higher clustering of the poor between the absolute poverty line and the cut-off point for the hard core poor defined by 1/3 of national rural mean expenditure.

SOCIO-ECONOMIC CHARACTERISTICS OF THE RURAL POOR, 1981/82

144. A *household* is defined as a person or a group of persons residing in the same home or compound and bound by ties of kinship, in that they are answerable to the same head and share a common source of food. There are three important ways of identifying whether you are dealing with the same household: These are:

- (a) Whether the people reside in the same compound;
- (b) Whether they are answerable to the same head; and
- (c) Whether they pool and share their resources.

If the answer to each of the above criteria is "Yes", then you are sure that you have identified the right household. If any of them is "No", then there is more than one household. A *head of household* is the senior most member of the household (to whom are other members of the household are answerable to and) resident in the household compound or, though residing elsewhere, returns at frequent intervals.

145. *Socio-economic status* is defined as the classification of income recipients based on the combined consideration of the classification of employment status, industry and occupation and the characteristics of the household enterprise, while *socio-economic group* is the grouping of households on the basis of the socio-economic status of the head of the household for purposes of summary tables on household income and consumption expenditure (United Nations National Household Survey Capability Programme, 1989). The appropriateness of classification of households based on the socio-economic characteristics of the household head depends on the definition and actual identification of the household head, and on the validity of the implicit assumption that the household head is the main determinant of the household's economic status.

146. The measures of prevalence, depth and severity of poverty were analyzed using the

absolute poverty line and the line defining the hard core poor as those households who can not meet their minimum calorie requirements even if they devoted all their expenditure on food, using sex of head of household, occupation of household head, educational status of household head, age of household head, household size, and land holding size. In the case of sex of household head, the results showed that prevalence, depth and severity of poverty was higher for male-headed households using absolute poverty line of Shs 105.94 per equivalent adult per month (see Statistical Appendix Table 17). The sex of household head was further broken down into "married" and "other" (single, separated, divorced) so as to be able to distinguish *de facto* (temporary but long-term absence of a male spouse) from *de jure* (lack of an adult male spouse) woman-headed households (see Clark, 1985). Female-married (*de facto* woman-headed households) showed slightly less prevalence, depth and severity of poverty than *de jure* woman-headed households.

147. The sex/marital status was used as a string variable and the poverty line allowed to change over the entire income distribution. The results for both 1981/82 (rural) and 1992 (rural and urban) are presented in Statistical Appendix Table 47. The results show that female-headed households were slightly better off than male-headed households over the entire income distribution, while female-married households were better off than "female-other" at every poverty line. However, sampling errors may differ by socio-economic group due to differences in relative sample sizes, thereby restricting the fortitude of the conclusions.

148. The ranking of poverty by occupation of household head showed that professional/managerial class was better off than "other" (which included university graduates but was an insignificant proportion of the sample), which was in turn better off than agricultural-based workers (which combined those working on own or other people's holdings). There is a strong negative correlation between education and poverty incidence. The data showed that households whose household heads had attained secondary level education (including Form 6) ranked least poor, followed by primary education, while the poorest did not have any formal education. As would be expected, household size was positively correlated with prevalence, depth and severity of poverty, while land holding size does not seem to be highly correlated with poverty, except for those with less than one acre who showed less prevalence of poverty compared with the landless and households with over one acre. This is probably because the database did not reveal the agricultural potential, i.e. if those with large holdings are in the marginal and medium-potential areas, the "holding size" variable could produce anomalous results. Poverty increases as age of household head takes its toll, with those in the age-group of below 30 having prevalence of poverty of about 31 per cent, compared with 43.5 per cent for age-group 31-40, and 54.3 per cent for household heads of 41 years and above. However, the age variable is highly correlated with household size, as children enrol in the household and vacate to form their own households over the household's life cycle.

149. Analysis using food poverty line on total expenditure as the cut-off point for the hard core poor (Shs 87.90 per equivalent adult per month), showed that the prevalence of ultra-poverty was lower for female-headed than for male-headed households, while female-married headed households (temporary but long-term absence of a male spouse) showed only slightly less poverty than "female-other", probably because of remittances from the male spouse (see Statistical Appendix Table 18). Socio-economic groupings by occupation of household head, education of household head and household size showed similar rankings as in the

case of absolute poverty cut-off point. However, poverty does not appear to differentiate between various land sizes, and hard-core poverty was lower among the landless (prevalence, 32.9 per cent; depth, 10.5 per cent; severity, 4.7 per cent), compared with those with over 20 acres (prevalence, 37.1 per cent; depth, 8.6 per cent; severity, 3.0 per cent). Hard-core poverty is more prevalent among household heads who are over 41 years of age, probably due to the increase in adult equivalents (household size).

SOURCES OF INCOME BY RURAL POVERTY GROUP, 1981/82

150. Statistical Appendix Table 19 shows the sources of income by strata and province. One of the striking features is the lack of consistency in spatial ranking between incomes and total expenditure due to measurement errors, and probably data manipulations from the time the data was collected during 1981/82. However, the relative contributions of various income sources conform to our expectations. For example, in Kiambu, Kisumu and the Coast districts of Kilifi/Tana River/Lamu and Kwale, the contribution of farm to total income was below 40 per cent, probably due to nearness to major towns, which increases access to salaries/wages and non-farm incomes. At the aggregate level, the Kenyan rural households derived 57.9 per cent of their incomes from farm sources, 10.4 per cent from non-farm, 23.1 per cent from salaries/wages, and 8.7 per cent from other sources. In comparison, the absolute poor, defined as those below the absolute poverty line, derived 63.0 per cent of their incomes from farm sources, and 17.4 per cent from salaries/wages (see Statistical Appendix Table 20).

CONSUMPTION AND EXPENDITURE PATTERNS BY POVERTY GROUP, 1981/82

151. Statistical Appendix Table 22 shows the food consumption patterns for all rural households, the non-poor and the poor, using the absolute poverty line. Under each consumption item, the first row percentages show the consumption share of the poverty group out of all households, while the second row is the share of the item in total food expenditure for the poverty group. For example, although the poor were 47.9 per cent of the total rural population in adult equivalents and 39.5 per cent by households during 1981/82, they accounted for only 18.16 per cent of total bread consumption, while bread accounted for 1.27 per cent of the poor's food budget. The poor spend large shares of their food budgets on maize (30.1 per cent), milk products (11.5 per cent), beans (9.6 per cent), and meats (8.8 per cent). The shares for the non-poor were maize (21.5 per cent), milk products (13.5 per cent), beans (9.0 per cent), and meats (10.8 per cent).

152. Among the non-food items, the poor as defined using the absolute poverty line mostly spent on clothing (24.0 per cent), non-durables (21.4 per cent), fuel (11.6 per cent), and education (11.0 per cent). They spend relatively low shares on licenses/insurance, reflecting their humble ownership of assets (e.g. transport equipment), and recreation (3.0 per cent). Since the percentage shares are as a proportion of the poor's non-food budget, their absolute expenditures on recreation and insurance/licenses were insignificant.

153. Within the food budget, the hard core poor, defined as those whose total expenditure is inadequate to meet their minimum food needs, in 1981/82 spent their highest shares on maize (30.9 per cent), milk products (10.8 per cent), beans (9.8 per cent), and vegetables (8.3 per cent). The difference with the "non-hard core", i.e. those above the absolute hard-

core poverty line, is most striking in maize consumption, where the corresponding budget share for non-hard core is 22.4 per cent. Within the non-food budget, the hard core poor have a striking share of (a) clothing (24.1 per cent of non-food expenditure) and (b) non-durables (23.1 per cent) e.g. furnishings, soaps, utensils, and domestic services — which probably reflects high levels of cleanliness and hygiene.

154. The share of food in total consumption expenditure is usually taken as a broad indicator of poverty, although the measure is crude as a policy variable in targeting of government programs. As would be expected, the average share of food in total expenditure was highest for the hard core poor (75.2 per cent), compared with 74.0 per cent for the poor defined using the absolute poverty line, and 63.2 per cent for all rural households during 1981/82. The corresponding shares for the non-poor were 61.0 per cent using absolute hard core poverty line and 59.6 per cent using absolute poverty line. It should, however, be noted that the 1981/82 rural household budget survey excluded imputed rent, other than for clusters in semi-urban clusters. Rent was therefore excluded in the computations of expenditure patterns.

155. The tabulations of item share of the poor in total item consumption mainly serves two purposes. First, it displays inequality in entitlements at the item level and in the aggregate. Second, it is important in making decisions on the appropriateness of general consumer price subsidies. For example, a consumer price subsidy on bread would be distributed between the non-poor (81.84 per cent) and the poor (18.16 per cent) defined using the absolute poverty line. However, it is more appropriate to tabulate item share of the poor excluding own consumption, i.e. purchases for consumption, in the analysis of possible beneficiaries of general consumer price subsidies. Consumption patterns of various ethnic communities in Kenya are largely defined by culture and a region's production structure, and do not therefore differ significantly between the poor and the non-poor.

156. Statistical Appendix Table 26 shows household food consumption by item, broken down into consumption of own production and purchases/gifts. The overall share of own consumption in total food consumption was 47.06 per cent, compared with 52.50 per cent for the poor at the absolute poverty line (Shs 105.94), and 44.99 per cent for the non-poor. For most of the food items with relatively high shares in total household food consumption, namely, maize, meats, milk, vegetables, beans and roots, the poor's share of own consumption in the poor's item consumption was higher than for the non-poor.

OWNERSHIP OF ASSETS IN RURAL KENYA, 1981/82

157. The distribution of land holdings by province and sex/marital status is shown in Statistical Appendix Table 27. Land holding excluded 163 households which had over 50 acres each, as the cases were distorting the mean land holdings. Out of the total rural population during 1981/82, households without holding were 11.9 per cent, while the corresponding figure for Rift Valley was a high 23.5 per cent and a low 4.4 per cent for Western province. Only 4.9 per cent of the households had holdings in excess of 20 acres for rural Kenya as a whole and a meagre 2.0 per cent for Central province.

158. Ownership of land was broken down by sex and marital status of the household head. While 69.8 per cent of the rural households were male-headed, 13.6 per cent of the male-

headed households were landless, while the corresponding landlessness of female-headed households was 8.1 per cent. The high landlessness of male-other households does not merit interpretation due to (a) their small sample size, and (b) the possibility that they might be single males who are yet to inherit the land from their parents/guardians but have tillage/usage access to land. However, there is more landlessness (10.0 per cent) and smaller land sizes among "female-other" headed households compared to female-married headed households.

159. Statistical Appendix Table 28 shows the ownership of livestock, selected farm tools, selected durable farm equipment, and motor vehicles and tractors in rural Kenya in 1981/82. The ownership of livestock reflects each region's production structure, and the picture would have been more complete if the regions were classified by main type of economic activity, e.g. export crops (coffee, tea, pyrethrum, pineapples, sisal, french beans), domestic industrial crops (cotton, sugar, tobacco, oil crops), food crops (maize, wheat, rice, sorghum/millet, beans, irish potatoes, cabbages), and livestock farming.

160. The importance of classification of agricultural output into export crops, industrial crops and food crops is important in the study of sources of regional prevalence of poverty and inter-spatial inequality due to (a) each province has a comparative advantage in the production of each group of crops, and (b) the factors affecting returns differs markedly from crop group to crop group. For example, based on the Ministry of Agriculture's provincial crop production data for 1989 and using 1989 producer prices (see Text Table 17 below), an estimated 57 per cent of value of export crops came from Central province, thereby benefiting/losing from exchange rate policies and economic conditions/policies of major importing countries; an estimated 85 per cent of domestic industrial crops were grown in Nyanza and Western provinces, thereby tying their economic fortunes to Government's pricing and marketing policies for the industrial crops and the efficiency of the agricultural parastatals mandated to manage the industrial crops; while about 42 per cent of food crops were grown in Rift Valley, thereby depending on the grain input, price and marketing policies. The pattern does not necessarily hold due to changes in production and relative prices since then.

Text Table 17: Regional Comparative Advantage by Major Crop Groups, 1989.

	Value Share of Export Crops (%)	Value Share of Industrial Crops (%)	Value Share of Food Crops (%)
Central	57.33	0.41	14.30
Coast	0.99	4.39	2.68
Eastern	20.89	7.90	17.01
Rift valley	9.11	1.63	42.62
Nyanza	9.71	33.53	12.68
Western	1.97	52.13	10.71
TOTAL	100.00	100.00	100.00

Source: Ministry of Agriculture.

161. Research carried out in the mid-eighties showed that there was a big difference between export crops and domestic crops in terms of their relative use of foreign inputs for production, marketing and transport (Sharpley, 1988). Overall, the import content of export crops was found to be significantly smaller (14 per cent of f.o.b. average) than that of domestic crops (32 per cent of ex-factory value). Smallholder export crops predominated among those with the lowest foreign exchange content. Smallholder coffee, cashew nuts and pyrethrum extract had import intensities ranging within 7-9 per cent of the f.o.b. value. Maize purchased by the NCPB was estimated to have an average import intensity of 29 per cent of the into-store value. The foreign exchange inputs of wheat and barley accounted for 40 per cent and 38 per cent respectively of the into-store value. The relatively heavy import content of domestic crops suggests that recent exchange rate adjustments might have adversely affected net farm incomes from domestic crops far more than export crops. However, it is necessary to revise the estimates of import intensities of various crops using current data to ascertain the veracity of the argument.

162. In contrasting the economic developments of Nyanza and Central province, Bigsten and Ndung'u (1992) states that: "In 1976, 70% of coffee and 21% of tea were grown in Central province, as compared with 4 and 7% respectively in Nyanza. The crops extensively grown in Nyanza are pyrethrum, cotton and sugar, which generate much less revenue than coffee and tea. There have also been major problems in the pyrethrum and cotton boards leading to large production declines." It is necessary to undertake research into (a) the current import intensities of various crops, and (b) the measures needed to encourage farmers to switch to higher value domestic crops in regions adversely affected by the reform process, or where export crops have not been important traditionally.

HOUSING AND ACCESS TO AMENITIES, RURAL 1981/82

163. The 1981/82 Rural Household Budget Survey collected data on housing characteristics and access to amenities e.g. water. The data on housing characteristics e.g. roof type, wall type, piped water and water closet were collected on the number of structures with a particular characteristic rather than of the main dwelling. It is therefore not possible to

derive housing characteristics of the main dwelling.

164. In rural 1981/82, the dominant roof type was thatched roof (68.4 per cent), with high ratios in Western (87.1 per cent), Coast (84.0 per cent) and Nyanza (82.2 per cent) and relatively low ratios in Eastern (65.2 per cent) and Central (23.2 per cent) (see Statistical Appendix Table 29). The second most important roof type was corrugated iron sheets (27.3 per cent), with high ratios in Central (62.1 per cent) and Eastern (34.4 per cent).

165. About 80 per cent of structures had mud walls, with high concentration in Western (95.7 per cent) Nyanza (93.7 per cent), Coast (80.3 per cent) and Rift valley (79.6 per cent) and relatively lower concentration in Eastern (65.0 per cent) and Central (65.8 per cent). The regional distribution of number of structures by roof and wall types is generally consistent with spatial distribution of poverty based on the 1981/82 data, with higher prevalence of corrugated iron roof structures and lower prevalence of mud wall structures in the relatively better-off provinces at that time.

166. The proportion of structures with piped water were 2.35 per cent, while those with water closet were 0.89 per cent. As shown in Statistical Appendix Table 30, about 57.3 per cent of the surveyed rural households had access to water within a distance of one kilometre from their households, while a cumulative 95.7 per cent had water within a distance of less than three kilometres.

167. Data were also collected on the household's access and distance to some basic support facilities provided by either nature, government or the private sector e.g. distance to water in wet season, and distances to bus or matatu route, dirt road, all weather road, tarmac road and market place. As shown in Statistical Appendix Table 31, the overall mean distance to water in wet season was 0.67 km, with a high 1.2 km in Coast and a low 0.38 km in Central province. The mean distance to roads by road type follow general expectations, with the mean distance to tarmac road being highest (12.7 km), followed by all weather road (3.8 km) and dirt road (1.3 km). Distance to various classes of roads were highest in the sparsely populated areas, mainly arid and semi-arid e.g. Kajiado/Narok, Baringo and Laikipia. The households in either productive or densely populated districts were generally nearer to roads.

THE EXTENT, DEPTH AND SEVERITY OF POVERTY, 1992

168. In the analysis of 1992 Welfare Monitoring Survey (WMS1) data, the regional price deflators used were as shown in Text Table 13. The rural component of the WMS1 database was analyzed separately from the urban component to permit comparison with the results from the 1981/82 Rural Household Budget Survey.

169. Problems were encountered in data processing. Out of 12,050 households sampled, 11,568 responded, while only 8,060 cases were processed since the data for the remaining households were incomplete. A large number of questionnaires were returned incomplete, with either one or more record types (forms) or variables within a record-type missing. Households with missing record-types or variables were dropped. This will undoubtedly reflect the representativeness of the results due to increased sampling errors. To the extent that the data loss was not uniformly distributed between and within strata, this will reduce the comparability of results by strata (district) and province. District-level estimates should therefore be interpreted with caution.

ANALYSIS OF RURAL FOOD POVERTY, 1992

170. Statistical Appendix Table 32 shows the prevalence, depth and severity of rural food poverty in 1992. Rift Valley was ranked as most food poor (81.0 per cent), followed by Western (78.4 per cent), Nyanza (70.7 per cent), Central (67.8 per cent), Coast (63.0 per cent), and Eastern (62.3 per cent), compared with the national rural average of 72.1 per cent. The deterioration in food poverty in Rift Valley over the 1982-92 decade may not be a sign of long-term decline in household food availability and entitlement but is probably explained by "tribal clashes" in 1992, which led to abandonment of farms before harvest. The decline in food production in Rift valley is likely to also have led to high food prices and temporary food poverty in other regions since Rift Valley is the main producer of marketed food.

ANALYSIS OF RURAL POVERTY, 1992: ABSOLUTE POVERTY LINE

171. Statistical Appendix Table 33 shows the provincial adult equivalent percentiles relative to national household deciles, using the income cut-off points from the rural component of the 1992 Welfare Monitoring Survey. For example, the results show that 5.47 per cent of adult equivalents in Central province had adult equivalent expenditures of less than Shs 206.36 per month. This is a crude measure of dominance in provincial poverty rankings. At lower cut-off points defined by the household deciles e.g. 30 per cent, Central province (rank 1), Eastern (2), and Coast (3) show less prevalence of poverty, compared with Nyanza (4), Rift Valley (5) and Western province (6). At the upper end of the scale, e.g. at 70 per cent of the national household deciles, Eastern is rank 4 and Rift Valley is rank 2. This shows the existence of richer households in Rift Valley compared with Eastern province. The provincial percentiles are in adult equivalents, and should therefore be compared with the national percentiles by adult equivalents, and not household percentiles as in Statistical Appendix Table 33. Statistical Appendix Table 34 shows the provincial adult equivalent percentiles relative to national adult equivalent deciles. This is an analytical pitfall to be avoided in developing the regional percentiles.

172. The absolute poverty line used on the WMS1 database component rural was Shs

484.98 per adult equivalent. The overall prevalence of rural absolute poverty was 46.3 per cent by adult equivalents and 41.5 per cent by households (see Statistical Appendix Table 35). The depth of poverty was 18.4 per cent, while the overall severity of poverty was 9.8 per cent. This is in contrast with the 1981/82 Rural Household Budget Survey data (Statistical Appendix Table 12), which showed an overall rural poverty prevalence, depth and severity by adult equivalents of 47.9 per cent, 14.9 per cent and 6.4 per cent, respectively. This shows that although the prevalence of poverty declined slightly over the 1982-92 decade, the depth and severity of poverty increased.

173. The prevalence of poverty by adult equivalents was highest in Western (54.8 per cent), followed by Rift Valley (51.5 per cent), Nyanza (47.4 per cent), Coast (43.5 per cent), Eastern (42.2 per cent), and Central (35.9 per cent). The provincial prevalence of poverty showed a slight overall reduction in absolute poverty during 1982-92, and the narrowing of gaps between the provinces. The districts with the lowest prevalence of poverty were Lamu/Tana River (20.6 per cent), followed by Kajiado/Narok (25.1 per cent), Kiambu and Meru/Tharaka (32.7 per cent), Laikipia (34.4 per cent), Nyeri (35.4 per cent), Nyandarua (36.7 per cent) and Murang'a (37.3 per cent). The prevalence of poverty was highest in Busia (67.7 per cent), West Pokot (65.2 per cent) and Kericho/Bomet (64.7 per cent). The depth of poverty was highest in West Pokot (35.4 per cent), and Busia (33.3 per cent). The improvement in the measures of prevalence, depth and severity of poverty in Nyanza relative to other provinces during the period 1982-92 is largely accounted for by improvements in Siaya district, where prevalence of poverty was 40.2 per cent compared with the national rural average of 46.4 per cent. The comparable figures for prevalence of poverty during 1981/82 were 56.4 per cent for Siaya, compared with a national average of 47.9 per cent. The 1993 cycle of the Welfare Monitoring Survey should be used to confirm the improvement in the relative positions for Siaya district in Nyanza and Lamu/Tana River in Coast province as the data appear suspect.

174. The data was also analyzed using the food poverty line per equivalent adult as the poverty line on total expenditure. Statistical Appendix Table 36 shows the poverty statistics on absolute "hard core" poor defined as those households who would not meet their minimum food requirements even if they allocated all their income on food. During 1992, the highest prevalence of rural absolute "hard core" poverty was in Western (45.4 per cent), followed by Rift Valley (42.9 per cent), Nyanza (39.1 per cent), Coast (32.8 per cent), Eastern (32.2 per cent) and Central province (28.1 per cent), compared with the national average of 37.4 per cent.

ANALYSIS OF RURAL POVERTY, 1992: RELATIVE POVERTY LINES

175. The overall rural mean expenditure per adult equivalent was Shs 894.64 while the median was Shs 573.37 in December 1992. These were used to derive the relative poverty lines of 2/3 of the mean (Shs 596.43) to define the poor, 1/3 of the mean (Shs 298.21) to define the relative hard core poor, and the median of expenditure. As shown in Text Table 18 and Statistical Appendix Table 37, the overall rural prevalence, depth and severity of relative poverty by adult equivalents was estimated at 57.1 per cent, 24.6 per cent and 13.8 per cent, respectively. The poorest province under the relative poverty line was Western (65.4 per cent), followed by Rift Valley (60.8 per cent), Nyanza (58.9 per cent), Coast (54.1 per cent), Eastern (53.6 per cent), and Central (47.5 per cent). The provincial rankings for

depth and severity of relative poverty are similar to those of prevalence of poverty, except for Rift Valley province which had a relatively higher rank of severity than depth of poverty, demonstrating the existence of economically distressed households.

176. The median of adult equivalent expenditure, i.e. that cuts half of the households, rather than adult equivalents, is used as a relative poverty line. At the median of adult equivalent expenditure, Western was ranked as having the highest prevalence of poverty (63.1 per cent), followed by Rift Valley (59.2 per cent), Nyanza (57.4 per cent), Coast (52.6 per cent), Eastern (51.4 per cent), and Central (45.0 per cent), compared with the national average of 55.2 per cent. However, there was a dramatic rank reversal when households are used, demonstrating the sensitivity of the poverty measures and provincial rankings to the household size and composition and the choice of equivalence scales. On the basis of households, Western retains the dubious distinction of having the highest prevalence of poverty (61.7 per cent), followed by Nyanza (54.1 per cent), Rift Valley (51.4 per cent), Eastern (47.2 per cent), Coast (44.7 per cent) and Central (39.3 per cent), compared with the national average of 50.0 per cent.

177. The analysis of poverty using the 1/3 of the rural mean expenditure, i.e. to isolate the relative hard core poor, showed the prevalence of poverty was highest in Rift Valley province (29.5 per cent), followed by Western (29.3 per cent), Nyanza (26.6 per cent), Coast (18.2 per cent), Eastern (16.7 per cent), and Central (13.5 per cent), compared with a national rural mean of 23.1 per cent. The districts with the highest prevalence of relative hard core poverty were Busia (44.8 per cent), Kericho/Bomet (40.2 per cent), and W. Pokot (40.0 per cent). The districts with the highest depth and severity of relative hard core poverty were W. Pokot (24.3 per cent; 18.1 per cent, respectively), followed by Busia (16.9 per cent; 8.5 per cent), compared with rural national mean of 7.8 per cent and 3.8 per cent, respectively. Kericho district consistently exhibited higher poverty levels than envisioned, both in 1982 and 1992. The economy of Kericho district should be investigated further, especially the role of the plantation agriculture – as Kericho is a major source of tea export earnings – on indigenous economic development.

178. According to the 1989-93 Kericho District Development Plan, the district produces adequate food for consumption and surplus for sale outside the district. In addition, Statistical Appendix Table 19 shows that Kericho district had household income above the national average in 1981/82. There are at least two possible explanations for Kericho's poverty statistics. First, migrant labour in the plantations may have low levels of consumption within the district due to transfers to home districts. Second, the survey instruments may not have imputed the true value of free housing, water and electricity and subsidized medical care, education and recreation (sporting facilities) for the responding households in the plantations. A district-level survey focusing on production, consumption, and movement of people (migration) and resources (transfers) need to be undertaken before any firm conclusions can be made about poverty in Kericho district. An initial reference point would be to empirically test the proposals suggested by Davies (1987) in her study of the direct and indirect links between Kericho tea plantations and the immediate rural economy (Kericho) and sources of migrant labour (mainly Nyanza province).

Text Table 18: Provincial Status of Rural Poverty, 1992 (%)

	All	Coast	Eastern	Central	Rift/V	Nyanza	Western
<u>Food poverty line</u>							
Prevalence (ad eq)	71.8	63.0	62.3	67.8	81.0	70.7	78.4
Prevalence (HHs)	63.8	53.8	55.2	57.8	72.1	63.5	74.2
Depth (ad eq)	34.0	26.1	22.8	27.9	45.0	34.8	39.9
Severity (ad eq)	20.6	14.5	11.7	14.8	29.9	21.6	25.0
<u>Absolute poverty line</u>							
Prevalence (ad eq)	46.3	43.5	42.2	35.9	51.5	47.4	54.8
Prevalence (HHs)	41.5	37.9	38.1	31.2	44.5	43.4	53.5
Depth (ad eq)	18.4	15.4	14.9	12.1	22.3	19.7	23.0
Severity (ad eq)	9.8	7.6	7.4	5.4	12.7	10.6	12.6
<u>Absolute Hard core poverty line</u>							
Prevalence (ad eq)	37.4	32.8	32.2	28.1	42.9	39.1	45.4
Prevalence (HHs)	32.8	27.4	29.1	24.2	36.2	34.8	42.9
Depth (ad eq)	13.7	10.9	10.5	8.1	17.4	15.1	17.6
Severity (ad eq)	7.0	5.2	5.1	3.4	9.5	7.6	9.2
<u>Relative poverty line</u> (2/3 of national mean)							
Prevalence (ad eq)	57.1	54.1	53.6	47.5	60.8	58.9	65.4
Prevalence (HHs)	51.9	46.3	49.3	41.6	53.0	55.5	64.0
Depth (ad eq)	24.6	21.7	21.1	17.7	28.6	26.1	29.8
Severity (ad eq)	13.8	11.4	11.1	8.7	17.1	14.8	17.3
<u>Relative poverty line</u> (Median of expenditure)							
Prevalence (ad eq)	55.2	52.6	51.4	45.0	59.2	57.4	63.1
Prevalence (HHs)	50.0	44.7	47.2	39.3	51.4	54.1	61.7
Depth (ad eq)	23.4	20.5	19.9	16.5	27.4	24.8	28.5
Severity (ad eq)	12.9	10.6	10.3	8.0	16.2	14.0	16.3
<u>Relative poverty line</u> (1/3 of national mean)							
Prevalence (ad eq)	23.1	18.2	16.7	13.5	29.5	26.6	29.3
Prevalence (HHs)	19.9	14.9	14.5	11.4	24.6	23.1	27.7
Depth (ad eq)	7.7	5.6	5.5	3.4	10.7	8.7	10.2
Severity (ad eq)	3.8	2.6	2.7	1.4	5.6	3.9	5.1

SOCIO-ECONOMIC CHARACTERISTICS OF THE RURAL POOR, 1992

179. According to the analysis plan prepared before the WMS1 data was analyzed, socio-economic grouping was to rely on the main source of income such that households would be divided between **agricultural households** and **non-agricultural households**. Agricultural households were split into **pastoralists** and **agriculturalists**, while agriculturalists were further separated into **export-crop oriented** and **food-crop farmers**. Out of food-crop farmers, a further sub-group, **subsistence farmers**, was identified as farmers whose consumption of own production is greater than their sales of own production. Non-agricultural households were first classified as being either **rural** or **urban**. Then households whose main source of income were either wages or self-employment were classified into **public sector**, **formal sector**, or **informal sector**, using the occupation of the household head to identify the sector.

180. Since the main source of income was the classificatory variable, two tests were conducted on the income data. First, the survey collected data on total wage/salaries for paid

employment for the whole household, and separately for each spouse. Initial screening of data showed that the combined spouses' income was greater than total wage employment for 4,886 (60.6 per cent) out of 8,060 households. The proportion is much higher if we exclude cases which did not report wage employment for the entire household and for the spouses. The mean of the spouses' combined income was Shs 5,525, compared with Shs 1,202 for households' combined wage/salary income. Since the wage income for the household is expected to be greater than or equal to the spouses' combined wage/salary income, the wage income data for the household could not be used in classifying households. Using spouses' combined wage income would have under-reported total household's wage income if there were other household members in paid employment.

	Spouses combined income	Wage/salary income
Mean	5,526.13	1,202.44
Minimum	0.00	0.00
Maximum	199,998.00	99,000.00

181. Further reliability tests were conducted on agricultural income data, by comparing agricultural production accounts (excluding cost of household labour) based on 1981/82 Rural Household Budget Survey and WMS1 survey database. The agricultural production gross income data for 1981/82 used was not based on total harvest or production, but on the sum of sales and consumption of own produce. Despite the fact that hired labour was not specifically mentioned in the WMS1 as part of agricultural expenses, the data for 1981/82 does not provide evidence of under-reporting agricultural incomes. However, it was deemed improper to assume that the agricultural expenses data collected included cost of hired labour, when it was not specified in the questionnaire or the enumerators' reference manual.

Text Table 19: Agricultural Production Accounts, 1981/82

	Mean	(%)
<u>Gross income</u>	<u>477.00</u>	<u>100.00</u>
Total cash sales	111.95	
Sales of livestock	162.40	
Sales of milk	30.32	
Sales of eggs	2.89	
Sales of hides	3.72	
Own crops produce consumed	111.94	
Own milk consumed	42.13	
Own eggs consumed	2.52	
Own livestock consumption	9.35	
<u>Agricultural expenses</u>	<u>33.00</u>	<u>6.85</u>
Animal feeds	1.92	
Veterinary supplies	0.49	
Hired labour on livestock	4.38	
Fertilizer	7.85	
Other agricultural inputs	3.42	
Hired labour on crops	14.63	

Text Table 20: Agricultural Production Accounts, 1992: Rural Data

	Mean	(%)
<u>Gross income</u>	<u>14,394</u>	<u>100.00</u>
Food crops - consumption and sales	9,304	
Sales of cash crops	1,238	
Livestock - consumption and sales	3,851	
<u>Agricultural expenses</u>	<u>1,546</u>	<u>10.74</u>
Cost of cash crop production	392	
Cost of food crop production	733	
Other agricultural expenses	421	

182. Due to (a) the difficulty of apportioning total agricultural income by source and (b) the ambiguity in the definitions of type of farmer (export-oriented, cash-crop, food/subsistence, pastoralist) in the enumerators' reference manual, the main source of income was not used to delineate socio-economic groups. The following variables were therefore used separately to delineate socio-economic groups: sex of household head, education level of the head, household size, size of holding, and age of household head. Socio-economic grouping scheme based on dominant sources of income will not be used due to ambiguity of issues relating to agricultural income and wage (paid) employment income data.

183. Statistical Appendix Table 44 shows the household size and composition by poverty and socio-economic groups. In rural Kenya, the mean household size was 5.31 persons and 3.16 persons in Nairobi and Mombasa combined. Household size was lowest in Central (4.62) and Nyanza (4.84). Male-headed households had a higher household size (5.78) than female-headed households (4.31), while female-married headed households had a higher household size (5.14) than female-other (3.57). Households whose heads had not attended school had lower household size (4.76) compared with primary education (5.70) and secondary education (5.40). As would be expected, the poor had a higher mean household size (5.97) compared with the non-poor.

184. The decomposition of poverty measures in rural Kenya by socio-economic groups using the absolute poverty line are shown in Statistical Appendix Table 45. Overall, there was no significant difference in poverty measures between male-headed and female-headed households. Although the sex of the head of the household does not appear to be a significant factor in the determination of incidence of absolute poverty, "female-married" headed households had prevalence of poverty of 44.6 per cent, compared with 52.9 per cent for "female-other". The depth and severity of poverty were also lower in female-married compared with "female-other". The same pattern applies at the poverty line defining the hard core poor as those whose entire expenditure falls below the food poverty line. The dominance tests applied on sex/marital status of household head (Statistical Appendix Table 47) shows that male-headed rural households dominate female-headed households by a slight margin over the entire income distribution, while female-married dominate "female-other" by a bigger margin. In comparison with rural 1982, there was a slight deterioration in the relative economic fortunes of female-headed households in general, and a dramatic deterioration for "female-other" households during 1982-92 decade.

185. The analysis does not imply that females in "female-married" and male-headed households are necessarily better off than females in "female-other" headed households because the survey data does not resolve the issue of "who sows, who reaps", i.e. intra-household gender inequality in households with an adult male/spouse, whether resident or not. The existence of predominantly male goods (e.g. beer and cigarettes) implies that females in a "female-other" household can potentially enjoy higher consumption than females in an equally endowed household with an adult male/spouse (male and female-married households).

186. When rural Kenyan households are ranked by economic status, the highest prevalence of absolute poverty was among subsistence farmers (52.3 per cent), compared with informal sector workers (41.4 per cent), and was lowest for public sector workers (21.2 per cent). Using education level of the household head, the lowest prevalence of absolute poverty was among heads of households with secondary education (26.7 per cent), compared with primary education (45.5 per cent) and "no education" (57.4 per cent). This implies that secondary education has substantial benefits to those who receive it, but is likely to have less aggregate impact unless the economy is transformed to provide substantial formal sector employment and a conducive climate for self-employment. As was the case during 1981/82, poverty consistently increase with household size. The ranking of poverty measures using size of land holding did not portray any clear trend, probably because of different agricultural potential of land holdings. Poverty increases with the age of the household head due to changes in household size over the household's life cycle. The ranking of poverty measures by socio-economic characteristics using the food poverty line on total expenditure were largely similar to those of the hard core poor.

CONSUMPTION PATTERNS BY RURAL POVERTY GROUP, 1992

187. Consumption patterns for food and non-food were computed at both the absolute poverty line of Shs 484.98 and using the food poverty line (Shs 404.66) on overall expenditure to define the absolute hard core poor. However, the itemized food budgets refer to purchases only since food consumption from own consumption were not itemized. Own consumption refer to both food crops and livestock, and accounted for 25.0 per cent of rural food consumption. The item share of the poor in total item market purchases can be used to infer the appropriateness of a general consumer price subsidy intended to benefit the poor. The poor (using the absolute poverty line) spend the larger proportions of their food budgets – including own consumption – on maize purchases (27.7 per cent), followed by sugar (13.7 per cent), compared with the non-poor whose expenditure on maize purchases was 23.8 per cent. However, the figures should be interpreted with caution since it is not possible to compute total maize consumption since we do not know maize consumption from own production.

188. The only food consumption data which can be interpreted in any meaningful way is the share of food in total expenditure, and the itemized non-food expenditure since consumption of own produce is expected to be negligible for non-food expenditure. Within food, consumption of own produce was 25.0 per cent in rural Kenya during 1992, compared with 25.7 per cent for the non-poor (defined using the absolute poverty line) and 22.4 per cent for the poor. This low level of consumption of own produce by the poor means that they are heavily dependent on food purchases, thereby raising their vulnerability to pricing

policies and other incentives affecting the major food crops.

189. Within non-food, clothing had the highest share (24.5 per cent), followed by education (14.7 per cent), transportation (9.8 per cent), and domestic wages (9.0 per cent). The proportion of the poor's budget spent on recreation was a meagre 2.3 per cent of their non-food expenditures, while education took 19.5 per cent. Education expenditures took an overall share of about 7.6 per cent of all rural poor's expenditures. The share of food in total expenditure was lower than expected: 48.7 per cent for the entire rural population, 61.2 per cent for the poor using the absolute poverty line, and 61.7 per cent for the hard core. Cost recovery in goods and services provided by Government and state-owned enterprises has largely affected non-food items e.g. education, health, electricity, and water, and could have led to an increase in non-food share in consumption expenditure during 1982-92.

SOURCES OF INCOME BY RURAL POVERTY GROUP, 1992

190. Statistical Appendix Table 40 shows sources of income by district in 1992. The contributions of various sources to total household income in Kenya's rural economy were net farm income (41.5 per cent), non-farm (23.8 per cent), salaries/wages (25.1 per cent) and other income (9.6 per cent), compared with 1981/82: net farm income (57.9 per cent), non-farm (10.4 per cent), salaries/wages (23.1 per cent) and other income (8.7 per cent). This shows a decrease of 16.4 percentage points in the share of net farm income and an increase of 13.4 percentage points in the share of non-farm income in rural Kenya during 1982-92 decade, which is in accordance with expectations. In the urban areas, non-farm income accounted for 25.2 per cent of household income, compared with 72.3 per cent for salaries/wages. Statistical Appendix Tables 41 and 42 shows that there were no significant variations of relative contributions of various income sources by rural poverty groups.

191. In the analysis of prevalence of absolute poverty by districts, Lamu/Tana River and Siaya strata appeared better-off while Kericho/Bomet appeared worse-off than was expected from casual knowledge of the districts. However, the relative household income for the three strata in the Statistical Appendix Table 40 are largely consistent with conclusions based on expenditure data, hence the need for further surveys to confirm the findings. In addition, Kajiado/Narok stratum showed the highest household income in rural Kenya, which is also largely consistent with expenditure-based poverty measures.

OWNERSHIP OF ASSETS IN RURAL KENYA, 1992

192. Estimated household ownership of land holdings by sex and marital status for rural Kenya in 1992 is shown in Statistical Appendix Table 56. The data shows that rural landlessness was 10.1 per cent overall, compared to 11.0 per cent for male-headed households and 8.1 per cent for female-headed households. Further breakdown of female-headed households show that landlessness was higher (11.0 per cent) and holding sizes smaller (3.3 acres) for "female-other" compared with female-married households (landlessness, 4.8 per cent; mean holding size, 4.2 acres).

193. Rural landlessness was found to be highest in Coast (25.3 per cent), followed by Central (17.9 per cent) and Rift Valley (17.5 per cent), while landlessness was lowest in

Eastern (1.6 per cent). Only less than one per cent of households in Central province have holdings in excess of 20 acres, compared with Rift Valley (8.0 per cent).

194. Ownership of assets is shown in Statistical Appendix Table 57. The data showed that mean holding size was highest in Rift Valley (6.7 acres), followed by Eastern (5.8), Western (4.4), Coast (3.9), Nyanza (3.6) and Central (2.3). Ownership of livestock (cattle, sheep/goats, poultry) reflect more on production structure vis-a-vis crop production, rather than being an indicator of a province's ranking in agricultural income.

195. One of the more recent sources of official statistics on smallholder holdings is based on the *Agricultural Production Survey, 1986/87* (APS) which covered 24 districts. The APS collected data on household size and holdings, land use, and the use of agricultural inputs. The summary report (highlighted in capsule form in *Economic Survey 1989*), gives useful district-level data on the extent of landlessness, holding sizes, and the pressure on land given the high population growth rate. The APS mainly covered the high and medium potential areas, but did not include data on holdings and land use for most of the low potential districts.

196. For the districts covered, the APS results show that 5 per cent of the households were landless. Landlessness is highest in Nakuru (22%), Kiambu (8%), Trans Nzoia (7%), Kitui (6%) and Nandi (6%). It is not clear about the significance of the indication of high landlessness in Nakuru district. According to *Economic Survey 1989*, those with no holdings in Nakuru district are "mainly workers in large scale farms and estates but including farming members of land buying companies whose farms had not been sub-divided at the time of the survey". For the districts covered by the APS, a further 40 per cent own up to 2 acres. The majority of these smallholdings are in Nyeri (62 per cent of the district total), Murang'a (65 per cent), Kiambu (68 per cent), Kisii (58 per cent), Kisumu (59 per cent) and Kakamega (59 per cent). Using figures on high-potential land equivalents per capita in the ILO Report (1972, p. 35) and taking into account the estimated increase in population between 1969 and 1989 (derived by dividing the ILO estimates by $1+r$, where r is the increase in population), it is evident that high-potential average plot sizes are very low, which are signs of massive landlessness in the near future (see Statistical Appendix Table 1). The statistics on high-potential land equivalents show that some of the land-distressed districts were Kisii and Kiambu (0.19 hectares of high-potential land equivalents per capita), Machakos (0.20) and Kakamega (0.22); while those with highest include Narok (2.27) and Samburu (1.43).

197. As we have seen, the pressure on good agricultural land in some districts is very high. As various studies have pointed out, the land policy has its roots in (a) the belief in economies of scale in agriculture, leading to bias in favour of large farms (Vandemoortele, 1987); (b) the fact that "most land is regarded as the exclusive domain of a particular tribe"; and (c) "the other that stems from the colonial period, when some land was alienated for large expatriate farms or set aside as Government land". (World Bank, 1983, p. 454). As for (a), the belief has been watered down by empirical research (mainly spurred by the ILO Report of 1972) which showed that "at the national level every 10% reduction in holding size raises output by 7% and employment by 8%" (World Bank, 1983, p. 71). Using smallholder data from IRS1, Vandemoortele showed that land concentration is more than that of incomes, mainly because labour intensity and output per hectare is higher in small than in large farms, i.e. an inverse relationship between farm size and efficiency. On (b), the World Bank noted

that "... a major impediment is tribal exclusiveness -- the unwillingness of one community, such as a tribe or a clan, to allow members of another community to establish rights in lands which they regard as their exclusive domain. This unwillingness can and does lead to violence... The probability of dispute over land rights and usage is ever present, threatening social stability" (World Bank, 1975, p. 455). In regard to (c), data shows that the land sizes are much higher and more unequally distributed in the former Scheduled Areas.

OVERVIEW OF THE EXTENT OF URBAN POVERTY, 1992

198. To estimate the extent of urban food poverty, the 1981/82 rural food basket was used, i.e. the weights derived from the 1981/82 Rural Household Budget Survey, and 1992 Nairobi prices. This would, undoubtedly, tend to under-estimate the food poverty line due to the rural-urban differences in consumption patterns characterized by the tendency to consume expensive calories e.g. alcohol and food preservatives/additives in urban areas. The urban areas taken for the analysis were Mombasa and Nairobi. The share of non-food for adult equivalent households within the range of -20 and +10 per cent of the food poverty line (i.e. purged for upper outliers) was taken as the non-food share for the urban poor, giving a non-food share of Shs 495.45, and overall poverty line of Shs 1,009.70. The urban mean expenditure including rent was derived as Shs 2,591.50 per adult equivalent, giving a cut-off point for the relatively poor of Shs 1,727.66 (2/3 of the urban mean) and relative hard core poor of Shs 863.83 (1/3 of the urban mean). Although the food poverty line applied on total expenditure is used to define absolute hard core poverty, it has no commonsense appeal for urban areas due to the high non-food share. In our case, food poverty line (Shs 514.25) was far below 1/3 of the mean (Shs 863.83) used to define relative hard core poverty.

199. As shown in Text Table 21 below, the prevalence of urban food poverty at food poverty line of Shs 514.25 per month per adult equivalent was 42.5 per cent by adult equivalents and 35.4 by households in 1992. Mombasa is slightly more food poor than Nairobi by about three percentage points. The prevalence of urban absolute poverty in 1992 was 29.3 per cent by adult equivalents and 20.6 per cent by households, compared with rural poverty of 47.9 and 39.5 per cent, respectively. The results should be cast in light of the methodology used to derive poverty lines which tended to under-estimate food poverty by imposing rural consumption patterns, and only using information on urban prices. There might also be a slight understatement of computed urban poverty measures compared with rural poverty due to the fact that non-household persons (e.g. beggars and parking boys), who are therefore not captured in the national sample survey frame, are expected to be more in urban than in the rural areas.

Text Table 21: Decomposition of P α Poverty Measures by Region, Urban 1992

	P α =0	P α =0	P α =1	P α =2	% of pop.	Contribution to national poverty (%)		
	Ad eq	hholds	adulte α	adulte α		P α =0	P α =1	P α =2
FOOD POVERTY (Shs 514.25)								
OVERALL	42.58	35.42	7.23	14.39	100.00	100.00	100.00	100.00
NAIROBI	41.92	33.97	12.96	5.95	77.63	76.44	74.75	75.40
MOMBASA	44.84	35.80	15.19	6.74	22.37	23.56	25.25	24.60
ABSOLUTE POVERTY (Shs 1,009.70)								
OVERALL	29.29	20.64	8.92	3.94	100.00	100.00	100.00	100.00
NAIROBI	26.45	19.39	7.68	3.42	77.63	70.09	66.78	67.32
MOMBASA	39.17	25.84	13.25	5.76	22.37	29.91	33.22	32.68

200. However, within Nairobi and Mombasa, spatial inequality is difficult to quantify because there are no natural spatial units of analysis. Unlike a country which can be split into provinces, there are no natural divisions in a city. Unlike rural settings where income disparities within an area may be low, a slum and a high income residential area may be separated by only a fence. Hence the difficulty in making location-specific recommendations on targeted interventions for the urban poor by the use of survey data. Mapping of poverty in a city therefore also requires casual knowledge of the locations of pockets of poverty in the city.

201. Due to the low share (0.08 per cent) of own-consumption in total food consumption, the fact that own consumption was not itemized does not affect urban consumption analysis. Maize consumption takes about 17.8 per cent of total food consumption, while the comparable figure for poor at absolute poverty line is 22.4 per cent. Cereals combined, i.e. maize and other cereals take about 30 per cent of food consumption. The poor's share of protein sources e.g. vegetables (11.6 per cent), meats (14.6 per cent) and milk (14.0 per cent), are lower than for the overall urban population, in addition to the fact that the absolute magnitudes are almost negligible. The share of food in total expenditure was 31.4 per cent for the whole urban population, and 50.9 per cent for the poor evaluated at the absolute poverty line. An analysis of urban consumption patterns, represented by Nairobi and Mombasa combined, shows that the hard core poor (defined as having overall expenditure below their minimum food poverty line) spend about 53.1 per cent of their budgets on food, compared with an overall average of 31.4 per cent. Out of food expenditure, the hard core poor allocate about 26 per cent to maize and its products, 10.9 per cent to cereals, and 14.6 per cent to vegetables, compared with overall averages of 17.8 per cent, 12.4 per cent and 12.2 per cent, respectively. Out of non-food expenditure, the hard core poor allocate 26.2 per cent to rent and 13.8 per cent to education, compared with overall averages of 19.2 per cent and 6.7 per cent, respectively.

202. Statistical Appendix Table 59 shows the decomposition of P α poverty measures by applying the rural absolute poverty line (Shs 484.98) on the 1992 rural adult equivalent

expenditure excluding rent, and urban absolute poverty line (Shs 1,009.70) on urban adult equivalent expenditure including rent. The national prevalence of poverty at the respective absolute poverty lines was 44.78 per cent by adult equivalents and 38.70 per cent by households; comprised of 46.33 per cent and 41.51 per cent, respectively, for rural areas, and 29.29 per cent and 20.64 per cent, respectively, for urban areas. The urban contributions to $P_{\alpha=0,1,2}$ poverty measures to national poverty measures were less than the urban's adult equivalent population share, demonstrating less prevalence, depth and severity of poverty than in the rural areas at the respective absolute poverty lines. Coast, Eastern and Central provinces contributed less to $P_{\alpha=0,1,2}$ than their respective adult equivalent population shares, while the reverse was true for Rift Valley, Nyanza and Western provinces for $P_{\alpha=0,1,2}$. However, district-level rankings do not follow the more aggregated provincial ranks since all districts in a province were not equally poor.

HOUSING AND ACCESS TO AMENITIES, RURAL AND URBAN 1992

203. The 1992 Welfare Monitoring Survey included questions on sources of water and distance to water in both wet and dry seasons. In rural Kenya, the main source of water in the wet season was rivers (28.9 per cent), but rivers become the main source for a larger number of households (36.0 per cent) in the dry season, due to the decline in the contribution of roof catchment in the dry season. The main source of water in urban areas in both dry and wet seasons was piped water, although this does not necessarily imply piped water inside the house or compound. In Nairobi, the change in the piped water source from 91.0 per cent in the wet season to 97.1 per cent in the dry season may be due to peri-urban clusters whose households draw water from rivers and other sources in the wet season, but buy piped water from other households in the dry season. The data imply that the supply of piped water to rural Kenyan households increased from 2.35 per cent in 1981/82 to 16.4 per cent in 1992. Distance to water in the wet season also appear to have declined during 1982-92, with 82.0 per cent of rural households having access within one kilometre in 1992, compared with 57.3 per cent in 1982. However, the rural households within less than three kilometres to water source remained the same, 96.2 per cent in 1992 compared with 95.7 per cent in 1982.

204. In 1992, the main sources of fuel in rural Kenya were wood-based, i.e. firewood and charcoal, with a combined share of 95.4 per cent; while the dominant source of fuel in the urban areas was paraffin (67.5 per cent). Only 3.5 per cent of the urban households responded as using electricity (mains) as the main source of fuel. The main source of lighting in rural Kenya was paraffin (92.9 per cent), compared with a low 1.5 per cent for electricity (mains). In the urban areas, paraffin was the also the main source of lighting (62.2 per cent), followed by electricity (35.0 per cent). Despite the rural electrification programme, paraffin remains the dominant source of fuel and lighting in Kenya. In the short-term, the data underlie the need to focus policy on pricing and supply of paraffin, and a re-examination of pricing and supply issues in the electricity sector in the longer-term.

205. Data was also collected on the characteristics of the dwelling unit e.g. type of toilet, wall type, floor type, roof type, number of rooms and tenancy status. The share of rural households using pit latrine were 78.0 per cent, and 58.9 per cent for urban households. A surprisingly high (50.2 per cent) of Nairobi households use pit latrine. The data on the number of rural households which reported that they had no toilet (19.0 per cent) should be interpreted with caution, as some respondents might not have separated the issues of

ownership and access.

206. In 1992, the dominant wall type for the main dwelling in rural Kenya was mud (74.6 per cent), 32.9 per cent in urban Kenya, and 32.6 per cent for Nairobi alone. The dominant floor type for the main dwelling in rural Kenya was also mud (80.4 per cent), compared with 30.0 per cent for the urban areas. In rural Kenya, the proportion of dwellings with mud and cemented floors was higher than for mud and cemented floors, due to dwellings with mud or cemented floors but with wood walls.

207. The dominant roof type for the main dwelling unit in the rural areas in 1992 was iron sheets (55.3 per cent), with a high 86.0 per cent in Central province and a low 24.8 per cent in Coast. The second most important roof type was grass/makuti (40.9 per cent), with a high 69.9 per cent in Coast province and a low 5.8 per cent in Central. The spatial distribution of wall types, floor types and roof types was generally in line with expectations, given the spatial distribution of poverty in Kenya. The data on wall type and roof type in 1992 are not comparable with 1982 data, since the 1981/82 data was on the number of structures with a particular wall or roof type, while the 1992 data refers to the characteristics of the main dwelling.

208. Data were also collected on the number of rooms in the main dwelling unit and the tenancy status. For the purpose of the survey, stores, kitchens, etc. were not counted as rooms even when they had windows. An estimated 24.8 per cent of rural main dwellings had only one room, compared with 67.2 per cent in urban areas. The prevalence of one-roomed house in rural Kenya was highest in Coast (35.5 per cent) and lowest in Central (9.1 per cent). The mean number of rooms in the main dwelling unit was lowest in Rift Valley (2.2 rooms), Nyanza and Eastern provinces (2.3), Coast (2.4) and Western (2.6), and highest in Central (3.1). When the data on the number of rooms is combined with that on roof, wall and floor types, Central province dominates in number of rooms, relatively low prevalence of mud walls and floors, and high prevalence of iron sheets roofing. The same pattern applies in the spatial ranking of poverty measures reported earlier.

209. As would be expected, most dwelling units in rural Kenya are owned by the households, and only 3.7 per cent were rented, most of which are expected to be in the small market centres. In the urban areas, those who owned and were living in their houses at the time of the survey were 10.6 per cent, while 84.0 per cent were rented. However, home ownership is likely to be slightly higher since a tenant who owned a house but did not live in it was not counted as a home owner for the purpose of the survey.

210. The rural provinces can be taken as natural units of analysis in comparing the relative ranking of housing and amenities with the provincial poverty measures ($P_{\alpha=0.1,2}$). However, there are no natural geographical boundaries of analysis for understanding the distribution of poverty within urban areas. Statistical Appendix Table 71 attempts to overcome this problem by comparing selected housing and household characteristics by urban poverty groups. The results show that, for both poor and non-poor, paraffin was the main source of fuel and lighting in Nairobi and Mombasa. The proportion of households using paraffin as the main source of fuel or lighting were not uniform by poverty groups.

211. In Nairobi, pit latrine was the dominant type of toilet (61.81 per cent) for the poor

compared with 46.60 per cent for the non-poor, but dominated in Mombasa for both poor and non-poor. In Nairobi, the dominant wall-type for the poor was mud (44.81 per cent) and cement for the non-poor (57.95 per cent). The main dwellings' ratio of mud to cement floors in Nairobi was about 1:1.1 for the poor and 1:2.5 for the non-poor. The housing characteristics by urban poverty groups, especially wall- and floor-types, probably demonstrates that the urban absolute poverty line (Shs 1009.70 per equivalent adult per month) was not overestimated.

BASIC NEEDS AND POVERTY, 1992

212. The poverty measures computed by regions and socio-economic groups have enabled us to identify areas of concern for policy. However, the poverty measures in themselves only describe the economic status of the household without indicating how poverty translates into quality and quantity of household members. Quantity here refers to household size and composition, while quality refers to health and education indicators. Health and education indicators have fundamental long-term implications because, in addition to consumption, they are inputs into human capital, and have important inter-generational effects. As we have seen, education attainment of the household head is an important determinant of household's economic welfare.

HEALTH

213. The 1992 Welfare Monitoring Survey included three health-related questions which were to be answered for each household member: whether one was sick last week, type of sickness, and the health restoration action taken. In interpreting the incidence of sickness, it is important to bear in mind that the information was collected on self-reporting basis. Empirical studies have demonstrated that there are significant differences in definition of symptoms that constitute a sickness episode among different social groups. Awareness of significance of symptoms is expected to be positively correlated with income and educational attainment. In addition, one respondent answered on behalf of all household members, while the respondent might not be familiar with the health problems of all the household members or the health restoration actions the household members took.

214. The responses to the sickness episode need to be interpreted within a model of sickness experience relevant to the environment the data was collected. For example, are the health restoration actions in the questionnaire viewed as mutually exclusive choices or sequence of actions in the sickness experience? If the options are discrete choices that a sick person undertakes, then the policy response would be to improve availability and quality of health restoration points depending on the frequency of consultations e.g. support faith healers if a big portion of the sick people are reported as having consulted faith healers. However, the consultation may not have led to health restoration, and the sick person may have "shopped" for another health restoration point e.g. visited a hospital. This implies that the responses in the questionnaire may depend on the point the person was in seeking help to restore health e.g. a person who responded that he visited a hospital may have started with a faith healer, while another responded a faith healer when he will finally end up in the hospital. Mwabu's (1986b) study in Meru district of Eastern province shows that a patient's health restoration actions in the sickness experience are sequential rather than mutually exclusive choices. In addition, since the responses on health restoration actions presupposed a sick role, they probably excluded health behaviour i.e. any action taken by a person who believes himself to be healthy, for the purpose of preventing disease or detecting disease in an asymptomatic stage. These actions include dental and medical checkups, immunizations, nutrition and exercise programs, and other activities aimed at maintaining fitness.

215. Suchman (1963) provides a useful framework to studying the illness experience and medical care. His five stage model starts with:

- (a) Symptom experience stage when the individual perceives that something is wrong. The person either denies that he is sick, delays action awaiting further development of the symptoms, or attempts self-treatment with folk medicine and the popular over-the-counter drugs e.g. antiseptics, cough/cold medicines, and antacid.
- (b) Assuming the sick role and seeking "provisional validation" from family, friends and co-workers for his claim to that role.
- (c) Provisional validation leads to the medical care contact stage when the person leaves the lay care system and enters professional care, where the person seeks treatment and professional validation for his claim to the sick role.
- (d) Dependent patient role stage, where the person reaches the decision to undergo treatment. This stage is also accompanied by substantial loss of personal rights, especially rights to privacy.
- (e) Recovery and rehabilitation, where the patient recovers and either leaves the sick role or gets hooked to the medical care system by feigning sickness to prevent relinquishing the sick role. The latter are referred to as malingerers.

216. Such a model is not necessarily relevant in all cultures or for all types of sickness e.g. an accident victim does not have to follow all the five stages. However, the importance of having a relevant health restoration behaviour model is important in the design of health care services delivery system and health training. For example, in some religious communities in Kenya, the professional validation is given by faith healers, who are therefore the only health restoration point. In such communities, health education should focus on advising people on significance of symptoms and the need to consult trained health personnel for professional validation that those symptoms constitute sickness.

217. Health behaviour models also distinguish between "disease" and "illness". "Disease" is understood to be an objective phenomenon characterized by altered abnormal functioning of the body as a biological organism, while "illness" is a subjective phenomenon in which individuals perceive themselves as sick. Illness therefore includes both (a) symptoms of an actual disease, and (b) perception that one is sick without any organic processes of disease being manifested. A priority survey like the Welfare Monitoring Survey, which was based on self-reporting rather than professional validation by trained health personnel, can only collect responses on illness rather than disease.

218. Within a health restoration model, lay persons only give provisional validation to the sick role. However, the sick may not be aware of the symptoms that constitute a particular type of disease, unless the disease is common in the locality or if the disease is recurring and the sick individual has previously received professional validation that the coincidental symptoms constitute a particular type of disease. In addition, trained health personnel do not always inform their patients the type of disease they are suffering from, and hence the patient may define symptoms to refer to a particular sickness when the symptoms actually relate to a different pathological disease.

219. Text Table 22 shows the prevalence of self-reporting sickness by regions and poverty groups during the two weeks preceding the survey day. The poverty groups were defined using the appropriate absolute poverty line, i.e. Shs 484.98 per monthly adult equivalent expenditure for rural areas and Shs 1009.70 for Nairobi and Mombasa. The results show that the rural prevalence of self-reporting sickness was 15.65 per cent, being highest in Western province (21.30 per cent), followed by Nyanza (19.18 per cent), Coast (17.85 per cent), Eastern (16.56 per cent), Rift Valley (12.17 per cent), and Central (9.68 per cent). The overall urban prevalence of sickness was 12.52 per cent, comprising Nairobi (11.54 per cent) and Mombasa (15.90 per cent). In both rural and urban areas, the prevalence of sickness was almost the same among the poor and the non-poor evaluated at the appropriate absolute poverty lines. The importance of the differences in the reported prevalence of sickness by regions and poverty groups is limited by (a) the fact that definitions of symptoms that constitute a sickness episode may differ by regions and socio-economic groups; (b) the severity of the illness is not known; and (c) the fact that the database presumably excludes the extent of health behaviour to prevent sickness or diagnose sickness in an asymptomatic stage. On the latter point, a region or poverty group that showed relatively less prevalence of sickness may have been seeking relatively more lay and professional health care in health behaviour actions.

Text Table 22: Prevalence of Sick Individuals by Region and Poverty Group, 1992 (%)

	All	Poor	Non-poor	Health Expenditure Per Capita (Shs per month)		
				All	Poor	Non-poor
Coast	17.85	17.43	18.19	5.48	2.05	7.57
Eastern	16.56	18.01	15.50	7.79	2.75	10.89
Central	9.68	8.33	10.42	9.56	2.36	12.83
Rift/V	12.17	11.28	13.11	9.21	3.02	14.18
Nyanza	19.18	18.18	20.09	9.44	3.49	13.99
Western	21.30	20.73	21.99	7.58	3.08	12.74
Total rural	15.65	15.47	15.81	8.63	2.94	12.66
Nairobi	11.54	12.21	11.29	17.37	5.64	21.66
Mombasa	15.90	13.40	17.54	12.42	6.74	16.32
Total urban	12.52	12.05	12.81	16.41	5.94	20.79

220. Text Table 22 also shows monthly health expenditure per capita by regions and poverty groups, excluding the subsidy element of the value of free or subsidized health services provided by the state and other organizations. The per capita health expenditure for the poor was roughly a quarter of that of the non-poor evaluated at the appropriate rural and urban absolute poverty lines. Although Central province had the lowest prevalence of sick individuals, it had the highest health expenditure per capita. This may be due to relatively higher expenditure in health behaviour actions, or higher cost of treatment compared with other regions.

Text Table 23: Types of Sickness by Poverty Group, Rural 1992 (%)

	All	Poor	Non-poor
Vomiting/diarrhoea	9.14	9.82	8.56
Fever/malaria	44.13	43.48	44.68
Cough/cold	20.21	19.87	20.50
Wound injury	5.27	4.36	6.05
Measles	1.37	1.46	1.29
Skin rash	3.41	3.96	2.94
Eye infection	2.17	2.22	2.12
Other	14.30	14.82	13.87
Total	100.00	100.00	100.00

Text Table 24: Types of Sickness by Region, Rural 1992 (%)

	All	Coast	Eastern	Central	Rift/V	Nyanza	Western
Vomiting/diarrhoea	9.14	8.40	13.60	4.63	10.58	10.58	9.58
Fever/malaria	44.13	53.74	42.21	34.40	48.57	48.57	45.14
Cough/cold	20.21	14.86	19.69	25.98	15.13	15.13	17.57
Wound injury	5.27	4.13	4.10	8.44	5.43	5.43	5.33
Measles	1.37	0.40	0.48	0.27	2.05	2.05	3.29
Skin rash	3.41	2.02	6.39	3.07	2.52	2.52	2.47
Eye infection	2.17	0.85	1.83	1.37	2.29	2.29	1.78
Other	14.30	15.59	11.69	21.84	13.43	13.43	14.84
Total	100.00						

221. Text Tables 23 and 24 shows the type of sickness for those individuals reported as sick in the last two weeks for rural 1992 by poverty groups. Fever/malaria were the most prevalent (44.13 per cent), followed by cough/cold (20.21 per cent) and vomiting/diarrhoea (9.14 per cent). The distribution of prevalence of types of sickness were roughly the same for both the poor and the non-poor. Text Table 24 shows that the pattern of prevalence of sickness was roughly the same for all provinces. However, the lay distinction between types of sickness may be affected by multiple symptoms based on a single underlying disease. For example, a stomach upset may cause headache, and different respondents could give significance of the symptoms as constituting either stomach-related disease or headache. For this reason, there could be overlaps of responses between the types of sickness broadly defined in the questionnaire as "fever/malaria" and "cough/cold". Furthermore, the types of sickness referred to as "other" comprised 14.3 per cent of sick individuals, thus exceeding the occurrence of wound injury (5.27 per cent), measles (1.37 per cent), skin rash (3.41 per cent), and eye infection (2.17 per cent). It is therefore possible for the occurrence of a particular disease generally classified under "other" to exceed that of a disease of minor occurrence but specifically referred to by name.

222. Table 25 shows the health restoration actions for those reported as sick in the last two weeks in the rural areas. The results show that 49.83 per cent of the sick individuals visited a health facility, followed by purchase of drugs presumably in shops or pharmacies without

prescriptions (36.02 per cent). The proportion of the poor who visited health facility (45.63 per cent) was less than that of the non-poor (53.37 per cent). It is assumed that "purchased drugs" refer to non-prescription drugs only. If any responses on "purchased drugs" referred to drugs prescribed by qualified health personnel or pharmacy drugs previously prescribed for a recurring sickness, then those responses legitimately belong to "visited health facility". It is also difficult to interpret responses on those who reported as having done "nothing" to restore health, since it is not known whether it was due to (a) inability to afford the health services, or (b) the sickness was not perceived as serious to warrant any health restoration action, or (c) the sickness may have been declared terminal in a previous treatment and the patient finds it futile to seek further treatment, or (d) religious beliefs may have discouraged seeking treatment.

223. For the two dominant types of health restoration points, i.e. visit to health facility and purchase of non-prescription drugs, Text Table 26 shows the distribution of types of sickness for each action. For those who visited health facility, 40.96 per cent had fever/malaria, followed by cough/cold (18.75 per cent) and vomiting/diarrhoea (9.47 per cent). For those who purchased non-prescription drugs, 54.30 per cent were suffering from fever/malaria and 22.70 had cough/cold. However, the responses could not be used to study the differences in utilization of various categories of health facilities for health restoration actions, since all health facilities were lumped up in one category.

Text Table 25: Actions Taken to Remedy the Sickness, Rural 1992 (%)

Action	All	Poor	Non-poor
Visited health facility	49.83	45.63	53.37
Purchased drugs	36.02	36.37	35.73
Traditional medicine	4.04	5.52	2.80
Traditional healer	1.02	0.90	1.12
Faith healer	0.62	0.66	0.58
Nothing	8.46	10.92	6.39
Total	100.00	100.00	100.00

Text Table 26: Types of Sickness for Those Who Attended Health Facility or Purchased Drugs, Rural 1992 (%)

	Health facility	Purchased drugs
Vomiting/diarrhoea	9.47	9.50
Fever/malaria	40.96	54.30
Cough/cold	18.75	22.70
Wound injury	6.81	1.95
Measles	2.01	0.30
Skin rash	3.77	2.06
Eye infection	2.54	1.41
Other	15.70	7.78
Total	100.00	100.00

EDUCATION

224. Education indicators usually employed in poverty analysis are literacy, enrolment and drop-out rates, and age-grade mismatch. The literacy rate is defined as the proportion of the population of seven years and above which can read or write. The **gross primary school enrolment rate** is the total number of children regularly attending primary school in the current year divided by the total number of children of primary school age (6-14 years). The **net primary school enrolment rate** is the total number of children of primary age (6-14 years) currently attending primary school divided by the total number of children of primary school age. The difference between primary school gross and net enrolment rates shows the children in primary school but were not of primary school age divided by the number of primary school age children. Similar computations will be done for secondary school gross and net enrolment rates assuming the normal secondary school age is 15-18 years.

225. An important education indicator is the drop-out rate at various education levels and the reasons for dropping out, especially reasons connected with the cost of education. The **drop-out rate** is normally defined as the number of children who left school in the current year (excluding those who left due to completion of the relevant education cycle) divided by the total number of children enrolled in the current year (plus the drop-outs). In the 1992 Welfare Monitoring Survey, information was collected on whether the household member attended school last year, is currently at school, and reason for not completing education cycle. The difference between the number of household members who are currently at school and those who were at school last year gives the total number who left school, including those who left due to completion of the relevant education cycle.

226. The codes for reasons for not completing education cycle included categories of "no interest", "none" and "not applicable". It would be logical to assume that a student who had "none" reason for quitting school should actually be coded under "no interest", while "not applicable" should be coded for all household members other those covered in other responses to the question. The category of "none" had very many responses, while males were also reported as having dropped out due to "pregnancy"! This shows lapses in data collection, entry and edit.

227. The **age/grade mismatch** shows the relation between age and school grade. If the children started school older than is normally the case, dropped out of school or repeated some grades in the past, the children will find themselves in grades inappropriate for their age. A child with an age/grade mismatch will observe a different educational experience, in addition to the fact such a child will have additional, but undesirable, adult options compared with classmates e.g. pregnancy, marriage or work. Other things being equal, age/grade mismatch is expected to be positively correlated with drop-out rates.

228. Text Table 27 shows the *self-reporting* literacy rates by regions, sex of household member and by poverty groups. In rural 1992, literacy rate was highest in Central (84.76 per cent), followed by Eastern (71.76 per cent), Western (68.61 per cent), Nyanza (66.88 per cent), Rift Valley (66.31 per cent), and Coast (56.26 per cent), compared with rural national literacy rate of 70.34 per cent. The overall literacy rate for Nairobi and Mombasa combined was 91.52 per cent, comprising Nairobi (93.24 per cent) and Mombasa (85.58 per cent).

Text Table 27: Literacy Rates by Regions and Poverty Groups, 1992 (%)

	All	Male	Female	Poor	Non-poor
Coast	56.26	67.49	45.09	50.00	61.17
Eastern	71.76	76.65	67.15	65.23	76.49
Central	84.76	90.69	79.41	82.36	86.09
Rift/V	66.31	70.94	61.57	60.05	72.95
Nyanza	66.88	76.19	58.43	61.96	71.29
Western	68.61	73.21	64.52	62.13	76.42
Total Rural	70.34	76.40	64.62	64.05	75.74
Nairobi	93.24	95.13	91.01	88.69	94.82
Mombasa	85.58	89.48	80.47	79.74	89.23
Total Urban	91.52	93.81	88.76	86.00	93.74

229. In all rural and urban regions, literacy rates were higher for males compared with females, with an overall rural male literacy rate of 76.40 per cent compared with 64.62 per cent for females. In all regions, the literacy rate was lower for individuals in poor households compared with non-poor, evaluated at the respective rural and urban absolute poverty lines. Literacy rates in Coast province are surprisingly low, with 45.09 per cent for females and 50.00 per cent for individuals in households below the absolute poverty line. In general, low literacy rates are associated with (a) poverty, since regions with low prevalence of poverty e.g. Central province have high literacy rates; and (b) is gender-biased since females have relatively lower literacy rates than males in all regions. A vicious circle appear to be in play: children from poor households are less likely to attain educational levels achievable by children from non-poor households, while education is negatively correlated with incidence and depth of poverty.

230. The Central Bureau of Statistics (CBS) carried out its first National Rural Literacy Survey (RLS) in 1976 as part of the Integrated Rural Surveys (IRS). The RLS was targeted on all persons in the age group 15+ excluding those undergoing full-time schooling and the literacy data was collected on a *self-reporting* basis. The RLS recorded a national literacy rate of about 46 per cent, varying from 60 per cent in Central province to 25 per cent in Coast province. However, the survey did not test respondents who claimed to be able to read or write.

231. The second literacy survey was carried out in 1980/81 within the national sample survey frame and targeted household members aged 12+. The 1980/81 survey was based on objective tests of respondent's ability to read and write in either English, Kiswahili or mother tongue. The third rural literacy survey was carried out in November 1988 and was also based on actual tests of a respondent's ability to read or write. Summary results of the literacy levels from the 1989 census, and 1988 and 1980/81 literacy surveys are reproduced in Text Table 28 below.

232. Results show similar pattern of literacy levels by province in both November 1988 and August 1989. In the 1988 survey, the lowest literacy rate was recorded in Coast (42.7 per cent) and the highest in Central province (69.2 per cent). The census results also recorded the lowest literacy level in Coast (61.6 per cent) and the highest in Central (85.1 per cent), excluding North Eastern province which reported a low 28.3 per cent. The comparability of literacy levels from the two surveys and the 1989 census are limited by (a) census data was on *self-reporting* basis while the 1980/81 and 1988 RLS were based on objective testing; (b) the census data was based on complete count rather than a sample; and (c) the census data refers to all household members aged six years and above while the sample surveys were targeted at older age cohorts. The literacy levels recorded from the census data were higher than those from the 1988 rural literacy survey in all provinces, probably due to (a) the 1989 census literacy data was collected on *self-reporting* basis and should therefore be considered as the upper-bound of the actual levels of literacy in the country; and (b) the census data include those aged six years and above but may eventually go to school. However, the literacy rates derived from the 1992 Welfare Monitoring Survey (Text Table 27) and the 1989 Population Census (Text Table 28) are largely consistent since they were based on almost similar age cohorts and were both on *self-reporting* basis.

Text Table 28: Literacy Rates by Region, 1980/81, 1988 and 1989 (%)

	1989			1988	1980/81
	Male	Female	Total	Total	Total
Coast	72.6	50.4	61.6	42.7	44.1
Eastern	77.2	65.5	71.1	52.9	47.7
Central	89.9	80.5	85.1	69.2	64.5
Rift/Valley	73.1	60.9	67.0	47.1	40.3
Nyanza	78.5	63.6	70.6	50.2	38.4
Western	75.8	64.6	69.8	51.0	47.0
North-Eastern	41.2	14.4	28.3	-	-
Nairobi	94.2	89.2	92.1	-	-
Total	78.36	65.46	71.84	54.3	47.2

Source: Central Bureau of Statistics, *Kenya Population Census, 1989*, March 1994; *Kenya Rural Literacy Survey 1988: Basic Report; Social Perspectives*, 7(1), December 1982.

Note: The 1989 census figures in the Table exclude cases of "not stated", while percentages in the published census report include "not stated".

233. Text Table 29 shows that the rural 1992 primary school gross enrolment rate was 95.39 per cent, with the male enrolment rate (96.51 per cent) being only slightly above that of females (94.25 per cent). The only rural regions with large gender disparities in primary gross enrolment were Coast province, where the rate was 75.52 per cent for boys and 66.66 per cent for girls; and Nyanza, with a rate of 109.16 per cent for boys and 94.80 per cent for girls. The gross enrolment rate for urban areas was 82.03 per cent on average, and the urban rates did not show significant gender bias. Overall gross enrolment rate can exceed 100 per cent if some of the children in primary school are above primary school age (6-14 years). Disparities in primary school gross enrolment rates by poverty groups were highest

in rural Coast province (64.56 per cent for the poor and 77.63 per cent for the non-poor) and Mombasa town (75.89 per cent for the poor and 101.65 per cent for the non-poor).

Text Table 29: Primary School Gross Enrolment Rates, 1992 (%)

	All	Male	Female	Poor	Non-poor
Coast	71.31	75.52	66.66	64.56	77.63
Eastern	92.71	91.39	94.09	89.26	95.29
Central	93.45	91.50	95.44	95.84	91.95
Rift/V	99.23	99.23	99.23	100.34	97.91
Nyanza	102.12	109.16	94.80	103.12	101.10
Western	95.10	96.12	94.06	94.67	95.68
Total Rural	95.39	96.51	94.25	95.41	95.37
Nairobi	80.15	81.81	78.61	82.00	79.31
Mombasa	88.24	85.13	91.33	75.89	101.65
Total Urban	82.03	82.61	81.49	79.95	83.21

234. Text Table 30 shows the primary school net enrolment rates. The overall rural net enrolment rate was 74.40 per cent, compared with 71.71 per cent for Nairobi and Mombasa combined. There were no significant gender differences in primary school net enrolment rates in the rural provinces and the urban areas. The primary school net enrolment rates for the rural poor was 72.32 per cent compared with 76.41 per cent for the rural non-poor; while those of the urban poor was 68.22 per cent compared with 73.69 per cent for the urban non-poor. The differences in primary net enrolment rates between the poor and the non-poor were highest in Mombasa town, rural Coast and rural Eastern provinces where the net enrolment rate for the non-poor exceeded that of the poor by at least 10 per cent.

Text Table 30: Primary School Net Enrolment Rates, 1992 (%)

	All	Male	Female	Poor	Non-poor
Coast	57.64	59.77	55.41	52.41	62.54
Eastern	73.22	73.04	73.40	66.71	78.08
Central	74.30	73.33	75.21	72.58	75.37
Rift/V	77.19	75.48	79.00	76.64	77.84
Nyanza	77.92	80.16	75.59	75.45	80.45
Western	73.35	73.00	73.72	73.69	72.90
Total Rural	74.40	74.24	74.58	72.32	76.41
Nairobi	73.13	76.65	69.86	73.17	73.11
Mombasa	67.03	63.96	70.10	58.38	76.44
Total Urban	71.71	73.62	69.92	68.22	73.69

235. Text Table 31 shows the secondary school gross enrolment rates by region, sex of student, and poverty groups. The rural 1992 secondary school gross enrolment rate was 29.28 per cent, and was highest in Central (38.04 per cent) and lowest in Coast (15.79 per cent). In every province, the rate was higher for males compared with females. The urban 1992 gross enrolment rate was 52.05 per cent, comprising Nairobi (58.34 per cent) and Mombasa (35.97 per cent). The gender differences in secondary gross enrolment was particularly marked in urban areas, with gross enrolment for males being roughly double of males in both Nairobi and Mombasa.

Text Table 31: Secondary School Gross Enrolment Rates, 1992 (%)

	All	Male	Female	Poor	Non-poor
Coast	15.79	17.30	13.93	7.83	21.71
Eastern	30.15	31.97	28.13	14.22	44.15
Central	38.04	43.00	33.72	20.92	50.52
Rift/V	21.69	23.29	19.98	12.07	32.49
Nyanza	31.90	39.95	21.94	18.16	46.15
Western	31.45	36.58	25.80	19.46	45.59
Total Rural	29.28	33.18	25.05	16.05	42.07
Nairobi	58.34	85.86	40.12	45.15	61.86
Mombasa	35.97	50.01	26.34	17.91	51.00
Total Urban	52.05	75.62	36.29	32.68	59.55

236. Secondary gross enrolment rates by poverty groups shows that, in rural areas, the rate was 42.07 per cent for the non-poor compared with 16.05 per cent for the poor. In Central province, the rates for the non-poor were 50.52 per cent and 20.92 per cent for the poor. The gross secondary school enrolment rates for Coast were 21.71 per cent for the non-poor and 7.83 per cent for the poor. On average, rural gross secondary school enrolment rates for non-poor were almost three times those of the poor. Although the Coastal region as a whole appear to fall behind the rest of the country in literacy and enrolment rates, the secondary school gross enrolment rates for girls in Mombasa town and rural Coast province merits special investigation to (a) verify the educational indicators in this report, (b) understand the cultural and resource-base dynamics at play, and (c) devise policy responses to counteract the distinct gender and poverty bias.

237. Text Table 32 shows the secondary school net enrolment rates by regions, sex of student, and poverty groups. Unlike the primary school net enrolment, secondary school net enrolment in some regions shows wide disparities by gender of the student. The overall rural secondary school net enrolment rate was 16.27 per cent, 17.62 per cent for males and 14.77 per cent for females. In Coast and Nyanza provinces, the net enrolment rates for boys were almost twice those of girls. The overall urban secondary school net enrolment rate was 29.88 per cent, 39.38 per cent for males and 23.52 per cent for females. The gender disparities in the urban areas is mainly contributed by Nairobi province, where the rate for

boys is almost double that of girls.

Text Table 32: Secondary School Net Enrolment Rates, 1992 (%)

	All	Male	Female	Poor	Non-poor
Coast	8.99	11.09	6.39	4.08	12.64
Eastern	16.82	17.04	16.57	8.10	24.49
Central	21.44	23.42	19.74	12.90	27.67
Rift/V	13.28	13.05	13.52	4.90	22.68
Nyanza	17.78	21.43	13.26	10.69	25.13
Western	14.90	16.59	12.84	9.76	20.97
Total Rural	16.27	17.62	14.77	8.61	23.67
Nairobi	33.67	46.39	25.25	33.35	33.76
Mombasa	20.19	21.86	19.04	9.84	28.80
Total Urban	29.88	39.38	23.52	22.59	32.70

238. The secondary school net enrolment rates shows wide disparities by poverty groups, except in Nairobi where the rates for the poor and the non-poor were almost the same. For example, the secondary school net enrolment rates in Coast was 4.08 per cent for the poor and 12.64 per cent for the non-poor, while the corresponding indicators for Rift Valley were 4.90 per cent for the poor and 22.68 per cent for the non-poor. The overall rural secondary school net enrolment rate was 8.61 per cent for the poor and 23.67 per cent for the non-poor, while the rates for Mombasa urban were 9.84 per cent and 28.80 per cent, respectively.

239. Text Tables 33 and 34 shows the age/grade mismatch for children in primary and secondary schools, respectively. The figures are the ratio of those above, say, primary school age (i.e. greater than 14 years of age) to total primary school enrolment. The overall rural primary age/grade mismatch was 21.40 per cent, compared with 10.08 per cent in the urban areas. Nairobi showed the lowest age/grade mismatch (5.75 per cent) in the country. There were no striking differences in age/grade mismatch by gender or by poverty groups.

240. The secondary school age/grade mismatch for rural Kenya was estimated at 37.24 per cent, compared with an urban index of 31.32 per cent. The highest age/grade mismatch was recorded in Western (49.30 per cent). The overall rural secondary school age/grade mismatch was higher for males (41.23 per cent) than females (31.60 per cent), compared with urban areas rates of 36.08 per cent for males and 24.68 per cent for females. This probably reflects a high drop-out for girls whose age do not match the secondary school grades.

241. The overall rural poor's secondary school age/grade mismatch index was 41.15 per cent compared with 35.80 per cent for the rural non-poor. The highest disparities in age/grade mismatch by poverty groups was in Rift Valley, with 52.63 per cent for the poor and 26.31 per cent for the non-poor. The data on age/grade mismatch in Nairobi was the

opposite of what would be expected, with the age/grade mismatch being higher for the non-poor (32.43 per cent) compared with the poor (19.33 per cent). This is, however, possible if the students with relatively higher age/grade mismatch and from poor families drop out of school and leave those of the non-poor to continue with schooling.

Text Table 33: Primary School Age/Grade Mismatch, 1992 (%)

	All	Male	Female	Poor	Non-poor
Coast	18.40	20.41	15.68	18.55	18.28
Eastern	20.81	19.85	21.79	25.06	17.84
Central	20.00	19.54	20.53	23.44	17.75
Rift/V	21.83	23.40	20.16	23.36	19.96
Nyanza	22.73	25.67	19.21	25.69	19.65
Western	21.85	23.32	20.32	21.64	22.13
Total Rural	21.40	22.53	20.21	23.65	19.24
Nairobi	5.75	4.31	7.14	5.69	5.78
Mombasa	23.07	23.36	22.81	22.57	23.48
Total Urban	10.08	9.01	11.11	11.05	9.55

Text Table 34: Secondary School Age/Grade Mismatch, 1992 (%)

	All	Male	Female	Poor	Non-poor
Coast	31.77	28.31	37.08	35.35	30.81
Eastern	35.98	44.25	25.51	41.23	34.49
Central	32.13	33.65	30.38	29.04	33.07
Rift/V	34.05	40.42	26.07	52.63	26.31
Nyanza	38.11	40.29	33.22	36.38	38.82
Western	49.30	52.07	45.83	47.87	50.03
Total Rural	37.24	41.23	31.60	41.15	35.80
Nairobi	30.29	33.06	26.37	19.33	32.43
Mombasa	35.57	49.05	18.03	33.80	36.09
Total Urban	31.32	36.08	24.68	22.96	33.10

THE DEGREE OF INEQUALITY IN KENYA, 1982-1992

242. As shown in Text Table 35 below, the Gini concentration ratio based on adult equivalent expenditure in rural Kenya increased from 0.3984 in 1981/82 to 0.4877 in 1992. During 1981/82, the consumption-based Gini coefficient was lowest in Nyanza (0.360) and highest in Rift Valley (0.401) and Central province (0.408), while in 1992 inequality was highest in Nyanza (0.526) and Rift Valley (0.508) and lowest in Coast (0.436). The consumption-based Gini concentration ratio by adult equivalents for Nairobi and Mombasa combined was 0.453 in 1992. Overall, inequality increased in all provinces during the 1982-92 decade.

243. Two points are in order. First, one should be careful not to mix expenditure-based and income-based inequality measures in inter-temporal comparison, as expenditure-based Gini ratios tend to show lower inequality due to under-reporting of income and the fact that consumption expenditure as proportion of income tend to decline as income rises i.e. decrease in the marginal propensity to consume. Second, the rural Gini ratio for 1974, as proxied by consumption, was 0.3818 (see Vandemoortele, 1987). However, the comparability of 1974 estimates with our estimates of income concentration for 1981/82 and 1992 is limited by the fact that, the former covered only smallholder agricultural households, thus omitting the landless and large farm areas.

244. Text Table 35 below also shows the rural Gini concentration ratios for 1981/82 based on household income. The overall Gini ratio was 0.501, with the greatest inequality within Rift Valley (0.548) and lowest in Coast province (0.408). The ranking of provinces by the degree of household income inequality, though different from those based on adult equivalent expenditures, have rank reversals characterized by minor differences in computed magnitudes of concentration. The relatively high degree of inequality in Rift Valley province is mainly due to income disparities by districts as demonstrated by district-level poverty measures, $P_{\alpha=0,1,2}$, in 1981/82 and 1992.

Text Table 35: Degree of Inequality in Kenya, 1982-92

	Household Income 1982	Adult equivalent Expenditure 1982	Adult equivalent Expenditure 1992
Coast	0.4080	0.3842	0.4355
Eastern	0.4658	0.3649	0.4532
Central	0.4642	0.4076	0.4530
Rift Valley	0.5477	0.4007	0.5080
Nyanza	0.4920	0.3595	0.5263
Western	0.4927	0.3789	0.4721
Total Rural	0.5010	0.3984	0.4877
Nairobi			0.4591
Mombasa			0.3402
Total Urban			0.4526

245. Text Table 36 shows the income shares of adult equivalent groups using expenditure as surrogate for income. The rural 1982 and rural 1992 data is in adult equivalent expenditure excluding rent, while urban 1992 is in adult equivalent expenditure including rent. The bottom 40 per cent had 12.85 per cent share of total adult equivalent expenditure in rural 1982, 10.59 per cent in rural 1992 and 10.33 per cent in urban 1992. The top 20 per cent had 56.91 per cent share in rural 1982, 60.47 per cent in rural 1992 and 58.84 per cent in urban 1992. At every decile, the cumulative shares were higher in rural 1982 than in rural 1992 and urban 1992, which is consistent with the measured increase in expenditure/income concentration (inequality) during the 1982-92 decade (see Text Table 35 above).

Text Table 36: Distribution of Income in Kenya, 1982 and 1992

		RURAL 1982		Rural 1992		Urban 1992	
		(%)	Cumulative (%)	(%)	Cumulative (%)	(%)	Cumulative (%)
DECILES							
1	POOREST	1.95	1.95	1.30	1.30	1.02	1.02
2		2.97	4.92	2.19	3.49	1.95	2.97
3		3.73	8.65	3.06	6.55	3.26	6.24
4		4.20	12.85	4.05	10.59	4.09	10.33
5		5.39	18.24	5.22	15.81	4.99	15.32
6		6.68	24.91	6.12	21.93	7.20	22.52
7		8.11	33.02	7.42	29.35	8.77	31.29
8		10.06	43.09	10.17	39.53	9.87	41.16
9		15.22	58.31	15.15	54.68	16.81	57.97
10	RICHEST	41.69	100.00	45.32	100.00	42.03	100.00
BOTTOM 40 PER CENT			12.85		10.59		10.33
TOP 20 PER CENT			56.91		60.47		58.84
TOTAL		100.00	100.00	100.00	100.00	100.00	100.00

246. There are various explanations of regional inequality, but only three will be highlighted. First, as Hazlewood observes, "the greatest regional inequalities are the work of nature" (1979, p. 175). This can be deduced by distribution of rainfall and the soil types, or more generally, the agro-ecological zones. The contribution of nature to regional inequalities, especially the farm income component, can be captured by the estimated availability of good agricultural land by district. However, nature's contribution to regional inequality has been moderated by a long-term process of population arbitrage due to net migration to high rainfall and good soil fertility, from low rainfall and poor soil fertility. This leads to an entropic degradation of the high rainfall and good soil fertility holdings through continuous cultivation.

247. The second is the attempt by Government to influence nature, mainly through interventions in agricultural commodity markets. Since most crops are region-specific, the

impact of Government policies on, say, maize, will affect the incomes of the regions with maize surpluses. In the same way, changes in world prices of export crops, e.g. tea and coffee, will have a great impact on the incomes of the regions growing the crops, although the impact filters to the rest of the economy through its effect on the external account and its impact on relative prices of tradeables and non-tradeables.

248. Third, the impact of Government expenditures on household welfare, i.e. the imputed value of Government services. This includes education, health and infrastructural development (roads, electricity, water, telephones, etc.). However, a neglected aspect of regional inequalities is the differential access to, say, educational institutions outside one's district through the quota system and the differential access to well-paying jobs for similar levels of educational attainment. This is to suggest that a more appropriate approach is the **property rights** theory, which encompasses any tangible and intangible assets that give a claim on income – licensing, educational attainment, degree of meritocracy in job selection, land, rent-seeking opportunities, etc. Incomes of individuals earned outside filter back to home districts through transfers at the family level and contributions to Harambee at the community level.

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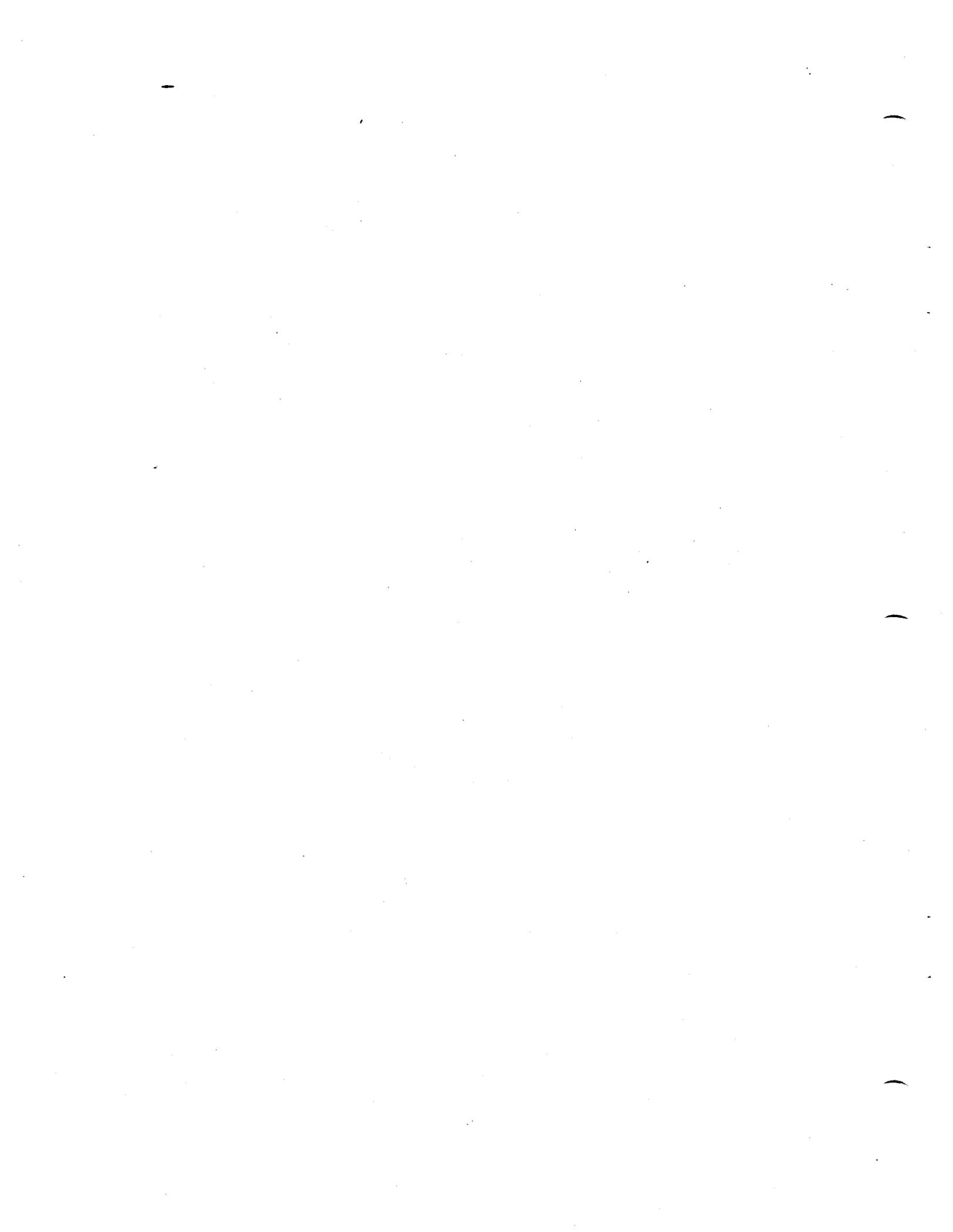
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***STATISTICAL
APPENDIX***



STATISTICAL APPENDIX

- Table 1: Estimated Availability of Good Agricultural Land per Person by District
- Table 2: Food Weight-to-Calorie Conversion Factors
- Table 3: National Monthly Rural Food Poverty Line per Adult Equivalent, 1981/82
- Table 4: Estimated Provincial Cost of Calorie Functions and Predicted Poverty Line, 1981/82
- Table 5: Determination of the Poverty Line by Province, 1981/82
- Table 6: Regression Estimation of the Overall Poverty Line Assuming Food Poverty Line is Known
- Table 7: Mean Producer Prices by Province, 1981/82
- Table 8: Mean Purchase Prices by Province, 1981/82
- Table 9: Decomposition of $P\alpha$ Food Poverty Measures by Region, 1981/82
- Table 10: Provincial Adult Equivalent Expenditure Percentiles Relative to National Rural Household Deciles, 1981/82
- Table 11: Provincial Adult Equivalent Expenditure Percentiles Relative to National Rural Adult Equivalent Deciles, 1981/82
- Table 12: Decomposition of $P\alpha$ Poverty Measures by Region, 1981/82, based on Absolute Poverty Line
- Table 13: Decomposition of $P\alpha$ Poverty Measures by Region, 1981/82, based on Absolute Hard Core Poverty Line
- Table 14: Decomposition of $P\alpha$ Poverty Measures by Region, 1981/82, based on Relative Poverty Line (2/3 of the mean)
- Table 15: Decomposition of $P\alpha$ Poverty Measures by Region, 1981/82, based on Median of Expenditure
- Table 16: Decomposition of $P\alpha$ Poverty Measures by Region, 1981/82: Relative Hard-Core Poverty Line
- Table 17: Decomposition of $P\alpha$ Poverty Measures by Socio-economic Groups, 1981/82: Absolute Poverty Line

- Table 18: Decomposition of P α Poverty Measures by Socio-economic Groups, 1981/82: Absolute Hard Core Poverty Line
- Table 19: Sources of Income by Region, 1981/82
- Table 20: Sources of Income by Poverty Group, 1981/82: Absolute Poverty Line
- Table 21: Sources of Income by Poverty Group, 1981/82: Absolute Hard Core Poverty Line
- Table 22: Household Food Expenditure Patterns by Poverty Group, 1981/82: Absolute Poverty Line
- Table 23: Household Non-Food Expenditure Patterns by Poverty Group, 1981/82: Absolute Poverty Line
- Table 24: Household Food Expenditure Patterns by Poverty Group, 1981/82: Absolute Hard Core Poverty Line
- Table 25: Household Non-Food Expenditure Patterns by Poverty Group, 1981/82: Absolute Hard Core Poverty Line
- Table 26: Household Own Consumption and Purchases of Main Food Items, Rural 1981/82
- Table 27: Distribution of Rural Households by Holding Size, 1981/82
- Table 28: Household Ownership of Selected Assets by Region, 1981/82
- Table 29: Housing Characteristics, Rural 1981/82 (%)
- Table 30: Distance to Water in Wet Season, Rural 1981/82 (km)
- Table 31: Average Distance to Selected Amenities, Rural 1981/82 (km)
- Table 32: Decomposition of P α Food Poverty Measures by Region, 1992
- Table 33: Provincial Adult Equivalent Expenditure Percentiles Relative to National Rural Household Deciles, 1992
- Table 34: Provincial Adult Equivalent Expenditure Percentiles Relative to National Rural Adult Equivalent Deciles, 1992
- Table 35: Decomposition of P α Poverty Measures by Region, 1992, based on Absolute Poverty Line
- Table 36: Decomposition of P α Poverty Measures by Region, 1992, based on Absolute Hard Core Poverty Line

- Table 37: Decomposition of P α Poverty Measures by Region, 1992, based on Relative Poverty Line
- Table 38: Decomposition of P α Poverty Measures by Region, 1992, based on Median of Expenditure
- Table 39: Decomposition of P α Poverty Measures by Region, 1992: Relative Hard-core Poverty Line
- Table 40: Mean Monthly Income by District, 1992
- Table 41: Sources of Income by Poverty Group, 1992: Absolute Poverty Line
- Table 42: Sources of Income by Poverty Group, 1992: Absolute Hard Core Poverty Line
- Table 43: Comparison of Household Income and Expenditure, 1992
- Table 44: Household Size and Composition by Regions, Socio-economic Groups and Poverty Groups, 1992
- Table 45: Decomposition of P α Poverty Measures by Socio-economic Groups, Rural 1992: Absolute Poverty Line
- Table 46: Decomposition of P α Poverty Measures by Socio-economic Groups, 1992: Absolute Hard Core Poverty Line
- Table 47: Gender/Marital Status per Adult Equivalent Expenditure Percentiles Relative to Aggregate Household Deciles
- Table 48: Rural Household Food Expenditure Patterns by Poverty Group, 1992: Absolute Poverty Line
- Table 49: Rural Household Non-Food Expenditure Patterns by Poverty Group, 1992: Absolute Poverty Line
- Table 50: Rural Household Food Expenditure Patterns by Poverty Group, 1992: Absolute Hard Core Poverty Line
- Table 51: Rural Household Non-Food Expenditure Patterns by Poverty Group, 1992: Absolute Hard Core Poverty Line
- Table 52: Urban Household Food Expenditure Patterns by Poverty Group, 1992: Absolute Poverty Line
- Table 53: Urban Household Non-Food Expenditure Patterns by Poverty Group, 1992: Absolute Poverty Line
- Table 54: Urban Household Food Expenditure Patterns by Poverty Group, 1992:

Absolute Hard core Poverty Line

- Table 55: Urban Household Non-Food Expenditure Patterns by Poverty Group, 1992: Absolute Hard Core Poverty Line
- Table 56: Distribution of Rural Households by Holding Size, Rural 1992
- Table 57: Household Ownership of Selected Assets by Region, Rural 1992
- Table 58: Proportion of Households/holders by Size of Holding, 1986/87 (%)
- Table 59: Decomposition of P α National Poverty Measures by Region, 1992: Respective Absolute Poverty Lines
- Table 60: Household Main Sources of Water (Now) in Wet Season by Province, 1992 (%)
- Table 61: Household Main Sources of Water (Now) in Dry Season by Province, 1992 (%)
- Table 62: Household Distance to Water in Wet Season (Now) by Province, 1992 (%)
- Table 63: Household Main Sources of Fuel by Province, 1992 (%)
- Table 64: Household Main Sources of Lighting by Province, 1992 (%)
- Table 65: Households by Type of Toilet by Province, 1992 (%)
- Table 66: Households by Wall Type by Province, 1992 (%)
- Table 67: Households by Floor Type by Province, 1992 (%)
- Table 68: Households by Roof Type by Province, 1992 (%)
- Table 69: Households by Number of Rooms by Province, 1992 (%)
- Table 70: Households by Type of Home Ownership by Province, 1992 (%)
- Table 71: Selected Household Indicators in Urban Areas by Poverty Groups, 1992 (%)

Table 1: Estimated Availability of Good Agricultural Land per Person by District, 1969, 1979, 1989

(Hectares of High Potential Land Equivalents)

District	Total area (Km ²)	High Potential equivalents (*1000 ha.)	Physiological Density		
			1969	1979	1989
Coast	82,830	568	0.81	0.57	0.41
Kilifi	12,414	162	0.53	0.38	0.27
Tana River	38,694	119	2.33	1.28	0.93
Lamu	6,506	74	3.33	1.75	1.30
Kwale	8,257	163	0.79	0.56	0.43
Taita-Taveta	16,959	50	0.45	0.34	0.24
Eastern	56,203	955	0.52	0.37	0.27
Machakos	14,178	284	0.40	0.28	0.20
Kitui	29,389	305	0.89	0.66	0.47
Meru	9,922	263	0.44	0.32	0.23
Embu	2,714	103	0.57	0.39	0.28
Central	13,173	912	0.54	0.39	0.29
Nyeri	3,284	160	0.44	0.33	0.26
Murang'a	2,476	217	0.49	0.33	0.25
Kirinyaga	1,437	100	0.46	0.34	0.26
Kiambu	2,448	170	0.36	0.26	0.19
Nyandarua	3,528	265	1.49	1.14	0.77
Rift Valley	109,339	3,101	1.52	1.00	0.65
Nakuru	7,024	301	1.03	0.57	0.35
Nandi	2,745	234	1.12	0.78	0.54
Kajiado	20,963	40	0.46	0.27	0.15
Narok	18,513	915	7.14	4.34	2.27
Kericho	4,890	380	0.79	0.60	0.42
Uasin Gishu	3,784	327	1.72	1.08	0.74
Trans-Nzoia	2,468	208	1.67	0.80	0.58
Baringo	10,627	190	1.18	0.93	0.66
Laikipia	9,718	138	2.08	1.03	0.63
W.Pokot	5,076	107	1.30	0.68	0.47
Samburu	20,809	156	2.22	2.04	1.43
Elgeyo-Marakwet	2,722	105	0.66	0.70	0.49
Nyanza	12,526	1,225	0.58	0.46	0.35
South Nyanza	5,714	567	0.85	0.69	0.53
Kisii	2,196	220	0.33	0.25	0.19
Kisumu & Siaya	4,616	438	0.56	0.46	0.33
Western	8,223	741	0.56	0.40	0.28
Kakamega	3,520	325	0.41	0.32	0.22
Bungoma	3,074	253	0.74	0.50	0.34
Busia	1,629	163	0.81	0.57	0.39

Source: Estimates of high potential land equivalent as calculated by ILO (1972), assumed constant to 1989. The ILO assumed that 5 hectares of medium-potential and 100 hectares of low potential are equivalent to 1 hectare of high-potential land.

Table 2: Food Weight-to-Calorie Conversion Factors

Nutrients per 100g Edible Portions

Food Item	Calories	Proteins
Wheat Products		
White Bread	240	7.7
Brown Bread	233	7.7
Maize		
Maize meal (unga)	341	9.3
Roasted maize	364	8.0
Maize flour (60-80% extraction)	334	8.0
Maize, white whole kernel, dried	345	9.4
Other Cereals		
Millet, finger, flour	318	5.6
Rice, milled, polished	333	7.0
Sorghum, flour	337	9.5
Sorghum, whole grain	343	11.0
Meat Products		
Beef, moderately fat	234	18.0
Poultry	138	20.0
Goat, moderately fat	171	18.0
Liver, beef	137	19.0
Mutton, moderately fat	257	17.0
Pork, moderately fat	408	12.0
Fish		
Fish, dried	255	47.0
Fish, average fillet	115	22.0
Milk & Milk Products		
Milk, Cow, whole	79	3.8
Milk, Cow, skimmed	38	3.5
Milk powder, Cow, Whole	463	2.6
Eggs & Poultry		
Egg, hen	140	12.0
Poultry, chicken	138	20.0
Oils & Fats		
Butter, from cow's milk	699	*
Coconut oil	900	*
Ghee	884	*
Margarine, fortified	747	*
Salad oil	900	*
Fruits		
Bananas, ripe, raw	82	1.5
Citrus, orange/tangerine, raw	44	0.6
Citrus, lemon/lime	40	0.6
Mango, ripe	60	0.6
Avocado	121	1.4
Vegetables		
Carrots, raw	35	0.9
Cow pea leaves, raw	45	4.7
Onion, raw	38	1.2
Tomatoes, raw	22	1.0
Beans		
Beans/peas, fresh	104	8.2
Beans, dried	320	22.0

Beans, green in pod, raw	35	2.5
Cow peas, dried	318	23.0
Roots		
Cassava	318	1.6
Potatoes, raw	75	1.7
Sweet potatoes	109	1.6
Yam	111	1.9
Sugars		
Sugar	375	0.0
Sugar cane	54	0.6
Tea/coffee		
Tea, hot water soluble from 100 gm, 5-10 min.	40	10.0
Coffee, ground, hot water soluble from 100 gm extracted in boiling water, 5 min.	56	8.0

Source: Food and Nutrition Cooperation: East, Central and Southern Africa (ECSA), *Food Composition Table for Energy and Eight Important Nutrients in Foods Commonly Eaten in East Africa (ECSA/CTA)*, 1987; and B.S. Platt, *Tables of Representative Values of Foods Commonly Used in Tropical Countries*, London School of Hygiene and Tropical Medicine, London, 1962.

Note: * Means no data.

Table 3: National Monthly Rural Food Poverty Line per Adult Equivalent, 1981/82

Food item	Monthly Consump. (Shs)	Calories produced	Calories produced as % of total intake	Quantities needed to meet requirements (Kg/month)	Prices (Shs/Kg)	Food Expenditure per month at poverty line (Shs)
Bread	2.35	1,288	1.65	0.46	4.38	2.03
Maize	24.46	45,445	58.23	11.56	1.83	21.16
Cereals	4.66	5,717	7.33	1.50	2.69	4.03
Meat	11.10	1,618	2.07	0.70	13.72	9.60
Fish	2.11	362	0.46	0.14	13.40	1.82
Milk	13.43	3,256	4.17	3.52	3.30	11.62
Eggs	1.05	187	0.24	0.12	7.88	0.91
Oils & fats	5.69	3,078	3.94	0.30	16.27	4.92
Fruits	3.74	1,082	1.39	1.04	3.11	3.23
Vegetables	6.99	1,248	1.60	2.70	2.24	6.05
Beans	9.31	5,784	7.41	1.61	4.99	8.05
Roots	5.95	3,345	4.29	2.07	2.49	5.15
Sugar	8.15	5,608	7.19	1.29	5.45	7.05
Tea/coffee	2.14	27	0.03	0.10	19.06	1.85
TOTAL	101.13	78,044	100.00			87.47

Source: Rural Household Budget Survey 1981/82 database for monthly consumption; price data from the Central Bureau of Statistics; and methodology based on Wasay (1977). The food poverty line computed using Lotus (Shs 87.47) differs slightly from the reported figure of Shs 87.90 calculated using SPSS package due to rounding up price and consumption data.

Table 4: Estimated Provincial Cost of Calorie Functions and Predicted Poverty Line, 1981/82

Province	Sample size	Adjusted Sample size	Cost of Calorie Function		R ²	Food poverty line (Shs p.m.) per adult equivalent	Elasticity of calorie demand with respect to food expenditure at poverty line
			a	b			
Coast	637	618	3.6489	9.089573E-6	0.700	70.77	1.1409
Eastern	885	864	3.7338	9.606834E-6	0.665	80.02	1.0262
Central	1169	1149	4.3944	3.894861E-6	0.457	105.36	1.7368
Rift Valley	1760	1692	3.5921	1.040116E-5	0.692	73.27	0.9850
Nyanza	911	892	3.6517	9.776763E-6	0.609	74.56	0.9224
Western	639	624	3.6697	9.416228E-6	0.714	74.09	1.1239
Total Rural	6001	5839	3.8713	7.225609E-6	0.557	78.18	1.1409

Source: Rural Household Budget Survey 1981/82 database, and methodology based on Greer and Thorbecke (1986c). The value of R² refers to the food poverty line and not the overall poverty line. The sample was adjusted by excluding all cases where monthly expenditure per adult equivalent was less than Shs 30 in 1981/82. All computations in the report are based on the adjusted sample size.

Table 5: Determination of the Poverty Line by Province, 1981/82

Province	Calorie Availability per ad eq. per day	adupeq Mean Expenditure without rent	Food poverty using Wasay method	Food poverty using (Cost of calorie function)	Overall Poverty Line (Cost of calorie function)	Overall Poverty Line (Cost of calorie function) :Non-Food Estimated Separately
Coast	2381	156.50	90.96	70.77	113.34	108.72
Eastern	2455	159.66	86.67	80.02	123.41	115.94
Central	3186	245.95	96.36	105.36	169.62	158.20
Rift Valley	2503	162.60	83.74	73.27	116.06	108.23
Nyanza	2221	143.25	86.42	74.56	112.89	105.03
Western	2254	146.17	84.96	74.09	115.02	108.87
RURAL	2528	171.53	87.90	78.18	121.52	113.52

Source: The Rural Household Budget Survey Database. Food conversion tables from Statistical Appendix Table 2. Adult equivalent scales are from Anzagi and Bernard (1977a). For the methods of derivation, see text.

Table 6: Regression Estimation of the Overall Poverty Line Assuming Food Poverty Line is Known

Functional Form: $\ln(NF)=a+b\ln(F)$					Functional Form: $\ln(Y)=a+b\ln(F)$			
RURAL 1981/82					RURAL 1981/82			
	A	B	Non-food	R2	A	B	Y	R2
COAST	(0.748)	1.030	49.27	0.4609	0.416	1.014	146.99	0.8419
EASTERN	(0.950)	1.028	37.98	0.3337	0.391	1.008	132.85	0.7908
CENTRAL	(1.726)	1.205	43.72	0.3980	0.147	1.066	150.55	0.7827
RIFT	(0.955)	1.046	39.48	0.3627	0.400	1.012	131.99	0.7814
NYANZA	0.038	0.831	42.25	0.2786	0.823	0.919	136.97	0.7759
WESTERN	(0.897)	1.033	40.21	0.3703	0.308	1.031	132.18	0.7774
TOTAL	(0.822)	1.076	54.35	0.3682	0.434	1.005	138.38	0.7983
RURAL 1992					RURAL 1992			
COAST	1.639	0.621	215.34	0.1620	1.793	0.791	699.29	0.6371
EASTERN	0.090	0.849	172.68	0.2205	0.791	0.950	634.84	0.7412
CENTRAL	1.398	0.721	334.86	0.1746	1.439	0.877	902.12	0.5987
RIFT	1.404	0.751	367.88	0.2795	1.557	0.870	876.25	0.6720
NYANZA	3.033	0.361	178.52	0.0794	2.008	0.754	668.57	0.6503
WESTERN	1.471	0.663	224.19	0.2380	1.367	0.866	676.45	0.7330
TOTAL	1.883	0.601	242.15	0.1658	1.618	0.833	746.46	0.6622
URBAN 1992					URBAN 1992			
NAIROBI	0.535	0.965	704.83	0.3033	1.052	0.984	1,335.81	0.5802
MOMBASA	1.100	0.797	436.22	0.1731	1.406	0.887	1,039.28	0.5454
TOTAL	0.446	0.963	639.22	0.2822	1.012	0.983	1,269.25	0.5714
Functional Form: $\ln(F)=a+b\ln(Y)$								
RURAL 1981/82					RURAL 1992			
	A	B	Y	R2	A	B	Y	R2
COAST	0.339	0.830	152.04	0.8419	0.694	0.806	738.71	0.6371
EASTERN	0.620	0.784	134.07	0.7908	0.916	0.780	642.63	0.7412
CENTRAL	0.927	0.735	142.11	0.7827	1.376	0.683	1,041.56	0.5987
RIFT	0.647	0.772	134.13	0.7814	0.599	0.772	1,085.56	0.6720
NYANZA	0.264	0.844	143.68	0.7759	0.277	0.862	731.19	0.6503
WESTERN	0.726	0.754	138.22	0.7774	0.311	0.846	778.52	0.7330
TOTAL	0.549	0.795	140.11	0.7983	0.644	0.795	842.91	0.6622
URBAN 1992					URBAN 1992			
NAIROBI	2.103	0.589	1,123.18	0.5802				
MOMBASA	2.041	0.615	931.88	0.5454				
TOTAL	2.183	0.582	1,075.52	0.5714				

Table 7: Mean Producer Prices by Province, 1981/82

	Coast	Eastern	Central	R/Valley	Nyanza	Western	National
Maize	2.31	1.32	1.55	1.57	1.64	1.62	1.57
Beans	4.37	3.00	4.63	3.28	3.06	3.22	3.40
Potatoes	2.47	2.09	3.36	1.45	1.40	1.82	2.59
Sorghum	1.24	1.42	3.00	2.09	2.07	1.35	1.70
Peas	4.22	2.06	2.53	3.62	3.04	3.70	2.70
Bananas	3.42	2.97	1.56	1.62	1.37	1.40	2.14
Millet	2.44	1.69	3.56	4.11	2.39	1.71	2.11
Cabbages	2.54	1.52	1.66	1.96	1.50	2.32	1.87
Other Vegetables	1.85	2.47	1.53	2.24	3.68	1.82	2.09

Table 8: Mean Purchase Prices by Province, 1981/82

	(Shs/kg)						
	Coast	Eastern	Central	R/Valley	Nyanza	Western	National
Maize	2.52	1.73	2.58	1.66	2.12	1.51	2.01
Beans	5.39	3.87	6.81	4.67	3.84	3.50	5.22
Potatoes	1.89	1.96	1.40	1.70	2.33	-	1.55
Sorghum	1.66	3.10	2.56	-	1.59	1.75	1.75
Peas	4.84	2.78	4.13	2.31	4.06	2.86	3.30
Bananas	2.00	2.39	1.59	2.20	1.59	0.78	1.79
Millet	1.84	3.40	4.55	-	2.55	2.05	2.71
Cabbages	1.52	1.51	1.83	-	1.90	1.78	1.65
Other Vegetables	1.56	2.58	1.86	3.35	1.69	1.83	2.41

Source: The Rural Household Budget Survey, 1982 database.

Note: The following outlier prices in the database were excluded in computing mean producer and purchase prices: (a) producer price for peas, Eastern province (Shs 25 and Shs 8,027); (b) purchase prices for peas, Rift Valley (Shs 26 and Shs 500); and (c) purchase prices for cabbages in Central province (Shs 20 and Shs 5,007) and Rift Valley province (Shs 55 and Shs 4,023).

Table 9: Decomposition of P_α Food Poverty Measures by Region, 1981/82

	(Shs 87.90)					Contribution to national poverty (%)		
	P _α =0	P _α =0	P _α =1	P _α =2	% of pop.	P _α =0	P _α =1	P _α =2
	adulteq	hholds	adulteq	adulteq		P _α =0	P _α =1	P _α =2
COAST RURAL	76.25	63.62	29.35	14.49	9.26	10.78	11.64	12.27
Kilifi, Tana & Lamu	81.34	70.94	33.43	17.05	5.41	6.71	7.74	8.43
Kwale	74.88	58.60	26.64	12.81	2.51	2.87	2.86	2.94
Taita Taveta	58.36	49.61	18.05	7.34	1.35	1.20	1.04	0.90
EASTERN RURAL	64.58	54.78	21.62	9.54	21.29	20.99	19.71	18.57
Machakos	71.43	60.22	21.71	8.52	8.77	9.56	8.15	6.84
Kisui	80.74	70.61	34.64	18.27	3.95	4.87	5.86	6.60
Meru	48.03	40.76	15.20	6.60	6.29	4.61	4.10	3.80
Embu	55.89	47.16	16.43	6.41	2.28	1.94	1.60	1.34
CENTRAL RURAL	37.89	28.69	10.12	4.06	17.17	9.93	7.44	6.37
Nyeri	27.56	21.41	7.54	2.85	3.32	1.40	1.07	0.87
Murang'a	37.86	29.49	7.65	2.26	4.82	2.79	1.58	1.00
Kirinyaga	53.01	41.70	18.32	8.15	2.15	1.74	1.69	1.60
Kiambu	34.21	24.27	9.34	4.30	5.20	2.71	2.08	2.04
Nyandarua	50.47	38.66	14.27	5.64	1.68	1.29	1.02	0.86
RIFT/V RURAL	69.63	58.15	25.32	11.93	21.24	22.57	23.03	23.17
Nakuru	55.82	43.05	18.44	8.29	3.53	3.01	2.79	2.68
Nandi	66.85	56.40	22.60	10.44	1.91	1.94	1.84	1.82
Kajiado, Narok	62.80	48.79	23.18	11.28	2.83	2.71	2.81	2.92
Kericho	79.93	65.75	29.52	13.10	4.53	5.52	5.72	5.42
Uasin Gishu	76.02	64.11	25.54	11.21	2.11	2.45	2.30	2.16
Trans Nzoia	68.99	58.75	25.96	12.40	1.81	1.91	2.01	2.05
Baringo, Laikipia	62.26	55.31	19.63	8.60	2.36	2.24	1.98	1.85
W. Pokot/Elgeyo M.	84.21	78.13	38.30	21.44	2.18	2.80	3.57	4.27
NYANZA RURAL	77.08	64.73	30.49	15.22	17.87	21.02	23.32	24.87
South Nyanza	72.07	62.12	28.43	14.19	5.21	5.73	6.34	6.76
Kisii	89.22	77.57	37.52	19.41	7.41	10.08	11.89	13.14
Kisumu	57.72	45.29	18.80	8.44	1.98	1.75	1.60	1.53
Siaya	69.29	57.23	24.93	11.50	3.27	3.46	3.49	3.44
WESTERN RURAL	73.25	65.07	26.37	12.25	13.17	14.72	14.86	14.75
Kakamega	69.84	62.56	23.76	10.49	8.29	8.83	8.43	7.95
Bungoma	77.36	67.27	29.00	14.02	3.35	3.96	4.16	4.30
Busia	82.78	73.96	34.75	17.92	1.53	1.93	2.27	2.50
TOTAL RURAL	65.53	54.50	23.36	10.94	100.00	100.00	100.00	100.00

Source: The Rural Household Budget Survey Database. Excludes households where monthly expenditure per adult equivalent was less than Shs 30 in 1981/82.

Table 10: Provincial Adult Equivalent Expenditure Percentiles Relative to National Rural Household Deciles, 1981/82

NATION (By households)	59.36	75.97	91.60	106.56	126.07	147.62	177.87	222.07	300.13	5,129.36
	10.00	20.00	30.00	40.00	50.00	60.00	70.00	80.00	90.00	100.00
COAST RURAL	17.58	30.51	46.87	54.92	63.81	74.65	82.96	91.57	96.96	100.00
Kilifi, Tana & Lamu	24.94	40.56	56.74	62.14	68.41	79.46	86.29	95.02	98.58	100.00
Kwale	7.27	15.76	33.98	46.70	57.91	67.01	77.63	86.11	94.87	100.00
Taita Taveta	7.28	17.65	31.30	41.26	56.33	69.61	79.50	87.88	94.35	100.00
EASTERN RURAL	10.54	23.17	36.38	49.10	59.95	71.26	81.12	88.86	94.97	100.00
Machakos	4.76	19.52	34.70	51.30	63.36	74.75	85.63	92.22	97.78	100.00
Kimii	30.81	45.41	60.75	72.00	82.11	86.51	93.87	96.28	98.30	100.00
Meru	8.49	16.07	25.64	33.95	43.53	58.59	69.69	81.97	91.37	100.00
Embu	3.31	18.26	30.29	42.72	53.71	66.39	73.21	82.05	88.29	100.00
CENTRAL RURAL	4.64	10.51	17.88	25.85	35.82	45.26	57.21	72.39	87.15	100.00
Nyeri	3.15	6.39	13.62	23.14	28.99	37.59	52.60	68.61	86.59	100.00
Murang'a	0.22	6.45	13.95	19.67	33.73	46.60	60.42	73.94	90.27	100.00
Kirinyaga	11.65	26.83	33.62	40.73	52.23	60.86	72.37	80.13	89.82	100.00
Kiambu	6.41	8.04	15.02	24.07	32.10	38.99	48.02	68.49	83.05	100.00
Nyandarua	5.85	17.04	26.29	35.40	45.83	56.02	66.08	77.56	88.60	100.00
RIFT VALLEY RURAL	15.50	28.65	40.48	51.12	61.84	72.35	81.53	88.87	94.88	100.00
Nakuru	11.04	24.47	29.90	42.06	53.65	68.96	78.09	87.69	93.99	100.00
Nandi	17.08	27.90	37.45	47.45	55.01	63.09	76.27	88.37	94.98	100.00
Kajiado, Narok	11.74	24.43	33.70	42.64	53.65	63.93	74.21	82.92	91.47	100.00
Kericho	11.83	27.74	46.88	60.82	72.34	79.07	86.85	93.08	97.02	100.00
Uasin Gishu	16.71	32.48	40.63	51.64	64.33	76.50	84.69	89.85	94.18	100.00
Trans Nzoia	19.56	31.62	43.84	52.01	61.60	73.35	85.55	91.23	95.80	100.00
Baringo, Laikipia	11.52	22.54	37.08	47.74	54.68	67.26	75.89	84.00	95.57	100.00
W. Pokot/Elgeyo M.	33.62	43.89	56.56	62.29	75.51	83.59	89.86	92.61	95.41	100.00
NYANZA RURAL	15.75	30.81	43.49	58.48	69.98	78.09	86.69	92.08	96.96	100.00
South Nyanza	24.87	35.26	44.88	54.68	69.31	78.26	83.93	89.43	96.11	100.00
Kisii	12.33	34.50	49.44	65.80	77.19	83.77	91.91	94.64	98.11	100.00
Kisumu	9.07	16.07	28.39	43.92	54.41	64.75	77.78	87.83	94.53	100.00
Siaya	13.01	24.29	36.96	56.79	64.18	73.05	84.64	93.11	97.16	100.00
WESTERN RURAL	16.11	29.27	42.17	54.75	63.99	74.33	83.96	90.61	96.76	100.00
Kakamega	13.40	25.20	38.81	53.11	62.35	72.79	83.42	90.94	95.67	100.00
Bungoma	17.15	32.83	44.89	55.73	65.76	75.31	83.47	88.89	99.10	100.00
Busia	28.51	43.59	54.46	61.49	68.95	80.55	87.96	92.61	97.58	100.00
TOTAL RURAL (in adult equivalents)	12.90	25.01	37.08	48.50	58.89	68.97	78.64	87.09	94.38	100.00

Source: The Rural Household Budget Survey Database. Excludes households where monthly expenditure per adult equivalent was less than Shs 30 in 1981/82.

Table 11: Provincial Adult Equivalent Expenditure Percentiles Relative to National Rural Adult Equivalent Deciles, 1981/82

TOTAL (%)	10.00	20.00	30.01	40.02	50.01	60.01	70.01	79.98	90.02	100.00
(Shs)	54.14	69.13	82.71	95.21	108.77	128.50	150.22	183.26	244.50	5,129.36
COAST RURAL	13.46	24.66	39.13	48.40	56.44	65.17	75.56	84.27	94.06	100.00
Kilifi, Tana & Lamu	18.88	33.78	49.43	57.76	63.63	70.23	80.18	88.20	96.83	100.00
Kwale	6.39	10.86	25.10	36.40	48.11	58.70	68.64	78.21	89.36	100.00
Taita Taveta	4.88	13.81	23.95	33.18	43.07	56.93	69.91	79.83	91.71	100.00
EASTERN RURAL	9.11	17.34	28.61	38.79	50.52	60.62	72.42	82.38	91.85	100.00
Machakos	3.35	11.65	24.37	37.17	52.65	63.36	75.85	87.52	95.31	100.00
Kitui	28.01	39.05	53.05	63.32	73.46	82.36	87.84	94.11	97.08	100.00
Meru	7.84	12.96	21.19	26.91	35.67	44.21	60.14	70.73	86.41	100.00
Embu	2.04	13.74	23.01	35.30	43.51	57.67	66.39	74.38	84.49	100.00
CENTRAL RURAL	3.57	8.39	13.24	19.59	27.10	36.91	46.89	59.90	77.52	100.00
Nyeri	2.69	5.91	7.78	16.35	23.86	29.39	39.73	54.03	73.99	100.00
Murang'a	0.22	4.51	10.15	15.55	21.90	34.63	48.72	63.76	80.41	100.00
Kirinyaga	8.49	20.77	28.40	34.49	42.62	52.23	62.77	74.21	83.54	100.00
Kiambu	5.40	7.16	10.86	16.60	24.07	33.81	40.19	51.51	73.02	100.00
Nyandarua	2.91	12.37	20.85	27.75	37.92	48.30	56.15	68.08	82.38	100.00
RIFT/V RURAL	11.12	23.82	33.43	43.82	52.52	63.35	73.43	82.65	90.75	100.00
Nakuru	7.94	17.58	25.96	32.63	43.61	56.53	70.17	79.86	89.71	100.00
Nandi	10.46	22.14	31.97	39.83	47.45	55.95	64.92	76.94	91.11	100.00
Kajiado, Narok	9.23	18.86	27.70	38.25	44.19	54.08	65.50	76.04	86.43	100.00
Kericho	8.78	25.06	35.35	51.46	61.40	74.09	80.03	87.49	94.22	100.00
Uasin Gishu	11.18	27.48	35.14	45.59	54.26	66.25	77.71	86.25	91.09	100.00
Trans Nzoia	11.55	25.56	38.60	45.71	52.58	63.40	73.35	86.91	92.04	100.00
Baringo, Laikipia	8.10	18.72	28.98	39.24	48.45	55.18	68.64	76.62	85.80	100.00
W.Pokot/ Elgeyo M.	27.04	39.79	49.17	58.46	66.44	76.63	83.84	90.16	94.47	100.00
NYANZA RURAL	12.28	25.12	35.42	48.10	61.14	70.69	79.03	87.21	94.21	100.00
South Nyanza	15.94	32.36	38.65	46.24	60.45	70.41	78.40	84.22	92.31	100.00
Kisii	11.44	25.64	40.30	55.49	67.16	77.49	85.02	92.18	96.11	100.00
Kisumu	7.99	13.04	19.20	33.98	45.17	56.23	67.61	78.76	90.65	100.00
Siaya	10.94	19.75	29.03	42.91	58.30	64.53	73.36	85.84	95.07	100.00
WESTERN RURAL	12.51	23.08	34.87	45.63	55.39	65.62	74.60	85.14	93.63	100.00
Kakamega	9.55	18.94	30.14	43.12	53.81	63.97	72.79	85.04	92.79	100.00
Bungoma	16.01	27.16	39.98	47.27	56.50	67.18	76.21	83.70	94.76	100.00
Busia	20.90	36.55	49.32	55.67	61.49	71.19	80.93	88.85	95.73	100.00

Source: The Rural Household Budget Survey Database. Excludes households where monthly expenditure per adult equivalent was less than Shs 30 in 1981/82.

Table 12: Decomposition of P α Poverty Measures by Region, 1981/82: Absolute poverty line

(Shs 105.94)

	P α =0	P α =0	P α =1	P α =2	% of pop.	Contribution to national poverty (%)		
	adulteq	hholds	adulteq	adulteq		P α =0	P α =1	P α =2
COAST RURAL	54.55	43.62	18.59	8.16	9.26	10.55	11.54	11.88
Kilifi, Tana & Lamu	62.14	51.47	23.41	10.76	5.41	7.02	8.49	9.14
Kwale	45.31	33.65	12.08	4.62	2.51	2.38	2.03	1.82
Taita Taveta	41.26	36.11	11.37	4.36	1.35	1.16	1.03	0.92
EASTERN RURAL	47.73	40.18	14.04	5.73	21.29	21.22	20.04	19.17
Machakos	49.03	40.34	11.65	3.84	8.77	8.98	6.85	5.29
Kitui	71.25	61.18	27.18	13.17	3.95	5.88	7.20	8.18
Meru	32.96	28.03	10.27	4.39	6.29	4.33	4.33	4.34
Embu	42.72	36.85	10.86	3.82	2.28	2.03	1.66	1.37
CENTRAL RURAL	25.69	19.08	6.74	2.67	17.17	9.21	7.76	7.19
Nyeri	23.14	16.74	4.96	1.78	3.32	1.60	1.10	0.93
Murang'a	19.12	16.01	4.35	1.28	4.82	1.93	1.41	0.97
Kirinyaga	40.73	32.69	13.75	6.03	2.15	1.83	1.98	2.04
Kiambu	24.07	15.94	6.35	2.88	5.20	2.61	2.21	2.35
Nyandarua	35.40	26.75	9.37	3.44	1.68	1.24	1.05	0.90
RIFT/V RURAL	51.05	42.82	16.74	7.34	21.24	22.64	23.84	24.51
Nakuru	41.72	32.42	12.79	5.53	3.53	3.08	3.03	3.07
Nandi	47.45	41.48	15.63	6.90	1.91	1.89	2.00	2.06
Kajiado, Narok	42.64	33.25	14.17	6.29	2.83	2.52	2.69	2.79
Kericho	60.82	48.58	17.62	6.80	4.53	5.75	5.35	4.83
Uasin Gishu	51.64	44.83	17.42	7.67	2.11	2.27	2.46	2.54
Trans Nzoia	51.63	43.32	18.08	8.05	1.81	1.95	2.19	2.29
Baringo, Laikipia	47.74	41.97	14.37	6.03	2.36	2.35	2.27	2.23
W. Pokot/Elgeyo M.	62.45	59.70	26.44	13.69	2.18	2.84	3.86	4.68
NYANZA RURAL	57.88	47.59	17.92	7.66	17.87	21.59	21.46	21.50
South Nyanza	54.18	46.79	19.98	9.44	5.21	5.89	6.98	7.72
Kisii	64.95	55.16	19.39	7.87	7.41	10.04	9.63	9.15
Kisumu	43.60	31.83	11.11	4.27	1.98	1.80	1.48	1.33
Siaya	56.41	44.67	15.41	6.40	3.27	3.85	3.38	3.29
WESTERN RURAL	53.79	47.96	17.40	7.62	13.17	14.79	15.36	15.75
Kakamega	52.58	48.07	15.34	6.28	8.29	9.10	8.52	8.18
Bungoma	53.30	42.87	19.40	9.05	3.35	3.73	4.36	4.76
Busia	61.49	56.57	24.23	11.75	1.53	1.96	2.48	2.82
TOTAL RURAL	47.89	39.45	14.92	6.37	100.00	100.00	100.00	100.00

Source: The Rural Household Budget Survey Database. Excludes households where monthly expenditure per adult equivalent was less than Shs 30 in 1981/82.

Table 13: Decomposition of P α Poverty Measures by Region, 1981/82: Absolute Hard Core poverty Line

(Shs 87.90)

	P α =0	P α =0	P α =1	P α =2	%of pop.	Contribution to national poverty (%)		
	adulteq	hholds	adulteq	adulteq		P α =0	P α =1	P α =2
COAST RURAL	43.86	33.31	12.20	4.83	9.26	11.78	11.92	12.07
Kilifi, Tana & Lamu	53.72	43.17	16.16	6.58	5.41	8.42	9.21	9.59
Kwale	30.28	20.32	6.70	2.45	2.51	2.20	1.77	1.66
Taita Taveta	29.58	24.58	6.57	2.24	1.35	1.15	0.93	0.81
EASTERN RURAL	33.42	27.49	8.53	3.21	21.29	20.64	19.15	18.41
Machakos	29.41	23.44	5.86	1.62	8.77	7.48	5.42	3.84
Kimii	58.76	48.93	19.31	8.55	3.95	6.73	8.05	9.11
Meru	24.76	20.12	6.50	2.57	6.29	4.52	4.32	4.36
Embu	28.78	24.75	5.70	1.80	2.28	1.90	1.37	1.10
CENTRAL RURAL	15.97	11.78	3.92	1.47	17.17	7.95	7.09	6.80
Nyeri	11.98	8.48	2.50	0.93	3.32	1.15	0.87	0.83
Murang'a	12.87	10.43	1.97	0.43	4.82	1.80	1.00	0.55
Kirinyaga	32.85	25.71	9.27	3.51	2.15	2.05	2.10	2.03
Kiambu	12.23	7.85	3.93	1.88	5.20	1.84	2.15	2.64
Nyandarua	22.78	18.00	5.41	1.65	1.68	1.11	0.96	0.75
RIFT/V RURAL	38.32	31.43	10.96	4.37	21.24	23.61	24.57	25.03
Nakuru	28.21	21.09	8.29	3.28	3.53	2.89	3.09	3.13
Nandi	34.25	29.69	10.36	4.12	1.91	1.89	2.08	2.12
Kajiado, Narok	32.21	24.62	9.31	3.79	2.83	2.64	2.78	2.89
Kericho	44.40	34.74	10.35	3.51	4.53	5.83	4.94	4.29
Uasin Gishu	36.75	29.34	11.59	4.56	2.11	2.25	2.58	2.59
Trans Nzoia	42.89	34.53	12.20	4.77	1.81	2.25	2.33	2.33
Baringo, Laikipia	36.43	32.36	8.92	3.45	2.36	2.49	2.22	2.20
W. Pokot/Elgeyo M.	53.33	50.07	19.83	9.34	2.18	3.37	4.55	5.48
NYANZA RURAL	40.14	32.86	11.42	4.48	17.87	20.80	21.52	21.58
South Nyanza	43.13	36.61	14.22	5.93	5.21	6.52	7.82	8.33
Kisii	45.11	38.23	11.74	4.37	7.41	9.69	9.17	8.72
Kisumu	23.47	19.09	6.17	2.33	1.98	1.35	1.29	1.25
Siaya	34.21	26.16	9.39	3.72	3.27	3.24	3.24	3.28
WESTERN RURAL	39.87	33.85	11.34	4.54	13.17	15.22	15.75	16.11
Kakamega	36.18	31.29	9.33	3.54	8.29	8.70	8.16	7.91
Bungoma	43.34	34.41	13.47	5.64	3.35	4.21	4.76	5.10
Busia	52.30	45.91	17.53	7.53	1.53	2.32	2.82	3.10
TOTAL RURAL	34.48	27.70	9.48	3.71	100.00	100.00	100.00	100.00

Source: The Rural Household Budget Survey Database. Excludes households where monthly expenditure per adult equivalent was less than Shs 30 in 1981/82.

Table 14: Decomposition of P_α Poverty Measures by Region, 1981/82:Relative Poverty

(2/3 of the mean: Shs.114.35)

	P _α =0	P _α =0	P _α =1	P _α =2	% of pop.	Contribution to national poverty (%)		
	adulteq	hholds	adulteq	adulteq		P _α =0	P _α =1	P _α =2
COAST RURAL	59.80	49.02	21.44	9.85	9.26	10.45	11.32	11.74
Kilifi, Tana & Lamu	65.45	55.33	26.43	12.77	5.41	6.68	8.14	8.89
Kwale	53.55	40.88	14.79	5.87	2.51	2.54	2.12	1.90
Taita Taveta	48.80	43.12	13.81	5.52	1.35	1.24	1.06	0.96
EASTERN RURAL	52.65	44.86	16.76	7.10	21.29	21.15	20.34	19.48
Machakos	54.67	45.41	14.69	5.16	8.77	9.05	7.34	5.83
Kitui	77.01	66.95	30.66	15.41	3.95	5.74	6.90	7.84
Meru	36.83	31.55	12.16	5.36	6.29	4.37	4.36	4.34
Embu	46.32	41.50	13.32	4.99	2.28	1.99	1.73	1.46
CENTRAL RURAL	30.44	23.31	8.29	3.35	17.17	9.86	8.11	7.41
Nyeri	25.75	19.92	6.39	2.34	3.32	1.61	1.21	1.00
Murang'a	26.34	22.60	5.70	1.81	4.82	2.40	1.57	1.12
Kirinyaga	47.33	38.10	15.97	7.28	2.15	1.92	1.96	2.02
Kiambu	26.94	18.00	7.69	3.47	5.20	2.64	2.28	2.32
Nyandarua	40.74	31.03	11.50	4.43	1.68	1.29	1.10	0.96
RIFT/V RURAL	55.88	47.13	19.44	8.87	21.24	22.40	23.54	24.26
Nakuru	45.95	36.60	15.12	6.73	3.53	3.06	3.04	3.06
Nandi	50.92	45.15	18.06	8.31	1.91	1.83	1.96	2.04
Kajiado, Narok	48.29	37.50	16.48	7.57	2.83	2.58	2.65	2.76
Kericho	65.09	52.71	20.89	8.57	4.53	5.56	5.39	4.99
Uasin Gishu	59.40	50.90	20.22	9.25	2.11	2.36	2.43	2.51
Trans Nzoia	55.82	46.53	20.72	9.66	1.81	1.91	2.14	2.25
Baringo, Laikipia	49.85	45.58	16.89	7.39	2.36	2.22	2.27	2.24
W. Pokot/Elgeyo M.	70.22	65.29	29.47	15.72	2.18	2.88	3.66	4.41
NYANZA RURAL	64.75	53.78	21.14	9.34	17.87	21.83	21.52	21.49
South Nyanza	63.28	54.19	22.94	11.14	5.21	6.22	6.81	7.47
Kisii	72.54	63.06	23.01	9.76	7.41	10.13	9.71	9.31
Kisumu	47.20	35.19	13.66	5.42	1.98	1.76	1.54	1.38
Siaya	60.09	47.77	18.57	7.91	3.27	3.71	3.46	3.33
WESTERN RURAL	57.63	52.73	20.24	9.21	13.17	14.32	15.18	15.61
Kakamega	56.20	53.03	18.22	7.77	8.29	8.79	8.60	8.29
Bungoma	58.46	48.67	22.15	10.71	3.35	3.70	4.23	4.62
Busia	63.57	58.54	27.02	13.72	1.53	1.83	2.35	2.70
TOTAL	53.00	44.30	17.55	7.77	100.00	100.00	100.00	100.00

Source: The Rural Household Budget Survey Database. Excludes households where monthly expenditure per adult equivalent was less than Shs 30 in 1981/82.

Table 15: Decomposition of P α Poverty Measures by Region, 1981/82: Relative Poverty
(Median of consumption expenditure: Shs.126.07)

	P α =0	P α =0	P α =1	P α =2	%of pop.	Contribution to national poverty (%)		
	adulteq	hholds	adulteq	adulteq		P α =0	P α =1	P α =2
COAST RURAL	63.61	53.35	25.20	12.25	9.26	10.02	11.04	11.54
Kilifi, Tana & Lamu	68.41	59.06	30.22	15.54	5.41	6.29	7.73	8.55
Kwale	57.18	45.03	18.59	7.80	2.51	2.44	2.21	1.99
Taita Taveta	56.33	49.63	17.37	7.31	1.35	1.29	1.11	1.00
EASTERN RURAL	59.69	51.73	20.46	9.15	21.29	21.61	20.61	19.82
Machakos	62.73	53.24	18.87	7.23	8.77	9.35	7.83	6.45
Kitui	82.11	72.07	35.20	18.53	3.95	5.51	6.58	7.45
Meru	43.53	38.45	14.75	6.79	6.29	4.66	4.39	4.35
Embu	53.71	48.00	16.81	6.79	2.28	2.08	1.81	1.57
CENTRAL RURAL	36.06	28.44	10.64	4.44	17.17	10.52	8.64	7.76
Nyeri	28.99	23.65	8.37	3.23	3.32	1.64	1.31	1.09
Murang'a	34.04	28.64	8.00	2.70	4.82	2.79	1.83	1.33
Kirinyaga	52.23	43.03	19.16	9.11	2.15	1.91	1.95	1.99
Kiambu	32.42	23.22	9.77	4.40	5.20	2.86	2.40	2.33
Nyandarua	46.42	35.99	14.45	5.95	1.68	1.32	1.15	1.01
RIFT/V RURAL	61.80	52.87	23.13	11.08	21.24	22.32	23.25	23.95
Nakuru	53.65	41.98	18.39	8.52	3.53	3.22	3.07	3.06
Nandi	55.65	50.12	21.36	10.34	1.91	1.80	1.93	2.00
Kajiado, Narok	53.65	42.72	19.69	9.44	2.83	2.58	2.63	2.72
Kericho	72.54	60.92	25.39	11.16	4.53	5.58	5.44	5.14
Uasin Gishu	64.33	55.69	24.11	11.55	2.11	2.30	2.40	2.48
Trans Nzoia	61.60	52.20	24.22	11.94	1.81	1.89	2.07	2.20
Baringo, Laikipia	54.68	50.97	20.20	9.38	2.36	2.19	2.25	2.25
W. Pokot/Elgeyo M.	74.06	69.14	33.50	18.52	2.18	2.74	3.45	4.10
NYANZA RURAL	69.88	58.93	25.45	11.83	17.87	21.22	21.52	21.51
South Nyanza	69.31	59.52	26.99	13.60	5.21	6.14	6.65	7.21
Kisii	77.19	67.76	27.84	12.55	7.41	9.72	9.75	9.46
Kisumu	53.47	41.82	17.17	7.20	1.98	1.80	1.61	1.45
Siaya	64.18	52.58	22.61	10.17	3.27	3.57	3.50	3.38
WESTERN RURAL	63.99	59.04	23.98	11.50	13.17	14.32	14.94	15.41
Kakamega	62.35	58.89	21.99	9.97	8.29	8.78	8.62	8.41
Bungoma	65.76	56.95	25.83	13.07	3.35	3.75	4.10	4.46
Busia	68.95	63.58	30.70	16.41	1.53	1.79	2.22	2.55
TOTAL RURAL	58.83	50.00	21.14	9.83	100.00	100.00	100.00	100.00

Source: The Rural Household Budget Survey Database. Excludes households where monthly expenditure per adult equivalent was less than Shs 30 in 1981/82.

Table 16: Decomposition of P_α Poverty Measures by Region, 1981/82: Relative Hard Core Poverty Line

(1/3 of the mean: Shs 57.17)

	P _α =0	P _α =0	P _α =1	P _α =2	% of pop.	Contribution to national poverty (%)		
	adulteq	hholds	adulteq	adulteq		P _α =0	P _α =1	P _α =2
COAST RURAL	16.02	9.87	3.31	0.97	9.26	13.08	12.65	12.51
Kilifi, Tana & Lamu	22.61	14.16	4.60	1.33	5.41	10.77	10.25	10.02
Kwale	7.07	5.07	1.70	0.55	2.51	1.56	1.76	1.91
Taita Taveta	6.28	4.67	1.16	0.31	1.35	0.74	0.64	0.58
EASTERN RURAL	9.73	7.94	2.07	0.60	21.29	18.26	18.14	17.79
Machakos	3.73	3.14	0.52	0.08	8.77	2.88	1.88	1.01
Kitui	29.54	22.13	6.67	2.08	3.95	10.28	10.87	11.44
Meru	8.26	6.71	1.82	0.50	6.29	4.58	4.71	4.40
Embu	2.53	3.19	0.73	0.30	2.28	0.51	0.69	0.94
CENTRAL RURAL	4.45	2.90	0.91	0.30	17.17	6.73	6.43	7.26
Nyeri	2.69	1.59	0.56	0.13	3.32	0.79	0.76	0.62
Murang'a	0.22	0.39	0.03	0.00	4.82	0.10	0.06	0.03
Kirinyaga	10.83	8.59	2.09	0.60	2.15	2.05	1.86	1.81
Kiambu	6.41	3.47	1.58	0.64	5.20	2.94	3.39	4.60
Nyandarua	5.85	4.71	0.51	0.09	1.68	0.86	0.35	0.21
RIFT/V RURAL	12.91	10.67	2.87	0.87	21.24	24.17	25.11	25.77
Nakuru	7.94	6.32	2.16	0.73	3.53	2.47	3.15	3.60
Nandi	12.57	10.47	2.57	0.78	1.91	2.11	2.02	2.08
Kajiado, Narok	11.74	8.78	2.65	0.82	2.83	2.93	3.08	3.23
Kericho	9.30	7.82	1.66	0.40	4.53	3.71	3.10	2.55
Uasin Gishu	13.96	11.32	2.77	0.81	2.11	2.59	2.40	2.39
Trans Nzoia	16.75	13.32	2.87	0.81	1.81	2.67	2.14	2.04
Baringo, Laikipia	10.07	8.65	2.21	0.70	2.36	2.09	2.15	2.29
W. Pokot/Elgeyo M.	29.17	25.77	7.88	2.51	2.18	5.60	7.07	7.60
NYANZA RURAL	12.99	10.66	2.88	0.83	17.87	20.45	21.23	20.62
South Nyanza	16.51	15.43	3.92	1.11	5.21	7.58	8.42	8.02
Kisii	12.33	9.56	2.72	0.81	7.41	8.05	8.31	8.30
Kisumu	8.75	6.34	1.42	0.32	1.98	1.53	1.16	0.88
Siaya	11.46	8.34	2.48	0.75	3.27	3.30	3.34	3.43
WESTERN RURAL	14.91	11.51	3.03	0.88	13.17	17.30	16.44	16.05
Kakamega	12.35	9.84	2.12	0.59	8.29	9.02	7.23	6.77
Bungoma	16.59	10.99	4.20	1.22	3.35	4.90	5.80	5.70
Busia	25.16	20.98	5.42	1.69	1.53	3.39	3.41	3.59
TOTAL RURAL	11.35	8.72	2.43	0.72	100.00	100.00	100.00	100.00

Source: The Rural Household Budget Survey Database. Excludes households where monthly expenditure per adult equivalent was less than Shs 30 in 1981/82.

Table 17: Decomposition of P α Poverty Measures by Socio-economic Groups, 1981/82: Absolute Poverty Line

(Absolute poverty line: Shs 105.94)

	P α =0	P α =0	P α =1	P α =2	%of pop.	Contribution to national poverty (%)		
	adulteq	hholds	adulteq	adulteq		P α =0	P α =1	P α =2
Total	47.98	39.65	14.95	6.38	100.00	100.00	100.00	100.00
Male	49.31	41.46	15.54	6.66	75.13	77.20	78.11	78.42
Female	43.99	35.44	13.16	5.53	24.87	22.80	21.89	21.58
TOTAL	47.98	39.65	14.95	6.38	100.00	100.00	100.00	100.00
Male-married	49.88	42.82	15.70	6.70	71.94	74.78	75.54	75.57
Male-other	36.35	27.67	12.07	5.71	3.19	2.42	2.57	2.86
Female-married	42.04	35.07	12.49	5.17	14.47	12.67	12.08	11.74
Female-other	46.70	35.88	14.09	6.03	10.41	10.13	9.81	9.84
TOTAL	47.89	39.45	14.92	6.37	100.00	100.00	100.00	100.00
Professional	16.79	13.43	5.40	2.62	3.96	1.39	1.43	1.63
Agriculture	51.52	43.22	16.31	6.98	75.10	80.78	82.10	82.34
Other	40.78	31.95	11.73	4.87	20.94	17.83	16.47	16.03
TOTAL	47.89	39.45	14.92	6.37	100.00	100.00	100.00	100.00
None	56.72	47.06	18.61	8.14	52.82	62.55	65.88	67.52
Primary	41.04	33.97	11.63	4.74	41.17	35.27	32.09	30.64
Secondary	16.56	13.76	4.94	1.96	5.53	1.91	1.83	1.70
Other	26.23	16.25	6.32	1.78	0.49	0.27	0.21	0.14
TOTAL	47.89	39.45	14.92	6.37	100.00	100.00	100.00	100.00
1 Person	15.39	15.25	4.30	1.81	2.59	0.83	0.75	0.74
2-3	24.39	23.09	7.29	3.08	9.85	5.02	4.82	4.76
4-5	37.17	35.34	11.19	4.68	20.18	15.66	15.14	14.84
6-7	52.22	50.82	15.84	6.62	26.19	28.56	27.81	27.23
8-9	52.18	51.34	15.43	6.34	19.87	21.64	20.54	19.77
10+	63.54	62.12	21.65	9.75	21.32	28.29	30.95	32.66
TOTAL	47.89	39.45	14.92	6.37	100.00	100.00	100.00	100.00
0 Acres	42.50	30.54	15.26	7.26	7.51	6.66	7.68	8.56
0.01-0.99	32.95	26.85	10.74	4.99	4.01	2.76	2.89	3.14
1-1.99	44.80	36.14	12.77	5.19	10.54	9.86	9.02	8.60
2-2.99	45.91	38.99	14.28	5.95	13.88	13.30	13.28	12.97
3-3.99	47.51	41.57	15.07	6.65	12.29	12.20	12.42	12.84
4-4.99	51.01	41.91	16.43	7.22	8.76	9.33	9.64	9.93
5-6.99	54.45	46.71	16.27	6.52	13.09	14.89	14.28	13.41
7-9.99	53.01	45.08	15.84	6.76	9.59	10.61	10.18	10.18
10-19.99	48.13	42.29	15.58	6.83	12.58	12.65	13.14	13.50
20+	47.91	40.21	14.36	5.64	7.75	7.75	7.46	6.87
TOTAL	47.89	39.45	14.92	6.37	100.00	100.00	100.00	100.00
Less than 25	30.27	22.41	9.55	4.38	4.07	2.57	2.60	2.79
25-30	31.50	26.12	9.14	3.78	11.48	7.55	7.03	6.81
31-40	43.51	39.56	12.64	4.98	23.85	21.66	20.21	18.64
41-50	54.32	48.17	17.57	7.83	20.86	23.65	24.56	25.67
50+	53.69	43.90	17.11	7.38	39.75	44.56	45.60	46.09

Source: The Rural Household Budget Survey Database. Excludes households where monthly expenditure per adult equivalent was less than Shs 30 in 1981/82.

Table 18: Decomposition of P α Poverty Measures by Socio-economic Groups, 1981/82: Absolute Hard Core Poverty Line

	(Shs 87.90)					Contribution to national poverty (%)		
	P α =0	P α =0	P α =1	P α =2	% of	P α =0	P α =1	P α =2
	adulteq	hholds	adulteq	adulteq	pop.			
TOTAL	34.58	27.86	9.50	3.71	100.00	100.00	100.00	100.00
Male	35.95	29.37	9.94	3.89	75.13	78.12	78.58	78.61
Female	30.41	24.35	8.18	3.19	24.87	21.88	21.42	21.39
TOTAL	34.58	27.86	9.50	3.71	100.00	100.00	100.00	100.00
Male-married	36.52	30.55	10.01	3.89	71.94	75.99	75.81	75.42
Male-other	23.12	17.45	8.25	3.71	3.19	2.13	2.77	3.19
Female-married	29.44	24.07	7.65	2.95	14.47	12.32	11.65	11.47
Female-other	31.76	24.69	8.91	3.54	10.41	9.56	9.77	9.92
TOTAL	34.48	27.70	9.48	3.71	100.00	100.00	100.00	100.00
Professional	10.62	8.91	3.74	1.75	3.96	1.22	1.56	1.87
Agriculture	37.86	30.92	10.42	4.06	75.10	82.46	82.55	82.29
Other	26.88	20.57	7.19	2.80	20.94	16.32	15.89	15.84
TOTAL	34.48	27.70	9.48	3.71	100.00	100.00	100.00	100.00
None	42.61	34.28	12.15	4.83	52.82	65.26	67.67	68.77
Primary	27.20	22.17	7.02	2.67	41.17	32.48	30.46	29.60
Secondary	12.10	9.68	2.99	1.05	5.53	1.94	1.74	1.56
Other	22.48	14.50	2.52	0.55	0.49	0.32	0.13	0.07
TOTAL	34.48	27.70	9.48	3.71	100.00	100.00	100.00	100.00
1 Person	8.82	8.74	2.65	1.07	2.59	0.66	0.72	0.74
2-3	16.58	15.94	4.58	1.78	9.85	4.74	4.75	4.73
4-5	26.14	24.64	7.01	2.68	20.18	15.30	14.91	14.59
6-7	36.92	35.67	9.95	3.76	26.19	28.04	27.49	26.58
8-9	36.42	35.66	9.39	3.57	19.87	20.98	19.67	19.11
10+	48.96	47.09	14.43	5.96	21.32	30.28	32.45	34.25
TOTAL	34.48	27.70	9.48	3.71	100.00	100.00	100.00	100.00
0 Acres	32.85	23.40	10.54	4.68	7.51	7.15	8.35	9.47
0.01-0.99	22.59	17.57	7.26	3.16	4.01	2.63	3.08	3.42
1-1.99	30.61	23.27	7.63	2.91	10.54	9.36	8.49	8.29
2-2.99	34.81	29.19	8.94	3.36	13.88	14.01	13.09	12.58
3-3.99	34.38	29.60	9.85	4.01	12.29	12.26	12.77	13.28
4-4.99	36.77	29.43	10.69	4.31	8.76	9.34	9.88	10.18
5-6.99	38.12	32.17	9.92	3.54	13.09	14.48	13.70	12.50
7-9.99	36.13	30.76	9.99	3.96	9.59	10.05	10.11	10.24
10-19.99	33.98	28.84	10.20	4.08	12.58	12.40	13.54	13.83
20+	37.06	28.57	8.58	2.97	7.75	8.33	7.02	6.20
TOTAL	34.48	27.70	9.48	3.71	100.00	100.00	100.00	100.00
Less than 25	19.17	14.53	6.17	2.81	4.07	2.26	2.64	3.08
25-30	21.57	17.35	5.61	2.15	11.48	7.18	6.79	6.66
31-40	31.18	28.18	7.57	2.63	23.85	21.56	19.05	16.92
41-50	38.92	33.47	11.51	4.79	20.86	23.54	25.31	26.92
50+	39.43	31.37	11.02	4.33	39.75	45.46	46.21	46.41

Source: The Rural Household Budget Survey Database. Excludes households where monthly expenditure per adult equivalent was less than Shs 30 in 1981/82.

Table 19: Sources of Income by Region, 1981/82

	Farm Enterprise	Non Farm	Salaries/ Wages	Other Income	Total	Farm Enterprise	Non Farm	Salaries/ Wages	Other Income
	shs	shs	shs	shs	shs	(%)	(%)	(%)	(%)
COAST RURAL	240.58	121.82	266.87	85.62	714.89	33.65	17.04	37.33	11.98
Kilifi, Tana, Lamu	209.12	115.81	225.55	69.84	620.32	33.71	18.67	36.36	11.26
Kwale	246.01	156.43	422.45	81.97	906.86	27.13	17.25	46.58	9.04
Taita Taveta	328.52	82.60	134.63	140.35	686.10	47.88	12.04	19.62	20.46
EASTERN RURAL	512.77	100.30	170.07	70.07	853.21	60.10	11.76	19.93	8.21
Machakos	531.55	123.66	209.69	83.83	948.73	56.03	13.03	22.10	8.84
Kitui	392.63	64.06	122.60	90.61	669.91	58.61	9.56	18.30	13.53
Meru	539.13	104.53	147.20	40.12	830.98	64.88	12.58	17.71	4.83
Embu	586.13	70.76	183.07	72.29	912.24	64.25	7.76	20.07	7.92
CENTRAL RURAL	434.86	73.27	222.03	83.26	813.42	53.46	9.01	27.30	10.24
Nyeri	526.21	91.36	190.50	85.22	893.29	58.91	10.23	21.33	9.54
Murang'a	361.04	60.58	158.81	81.44	661.86	54.55	9.15	23.99	12.30
Kirinyaga	486.31	55.24	158.03	45.03	744.61	65.31	7.42	21.22	6.05
Kiambu	355.53	85.70	351.03	103.74	896.00	39.68	9.56	39.18	11.58
Nyandarua	675.80	60.26	154.83	67.09	957.98	70.54	6.29	16.16	7.00
RIFT/V RURAL	644.82	68.25	167.29	41.34	921.70	69.96	7.41	18.15	4.49
Nakuru	419.02	42.28	141.12	40.29	642.71	65.20	6.58	21.96	6.27
Nandi	850.70	66.29	224.81	45.07	1186.88	71.68	5.59	18.94	3.80
Kajiado, Narok	1359.29	138.35	190.61	53.10	1741.34	78.06	7.95	10.95	3.05
Kericho	545.07	92.02	156.30	29.18	822.57	66.26	11.19	19.00	3.55
Uasin Gishu	602.34	61.97	178.49	47.03	889.84	67.69	6.96	20.06	5.29
Trans Nzoia	736.00	43.54	228.02	39.23	1046.78	70.31	4.16	21.78	3.75
Baringo, Laikipia	550.02	58.44	104.04	53.38	765.89	71.82	7.63	13.58	6.97
W. Pokot/Elgeyo M.	321.00	26.00	164.73	35.06	546.80	58.71	4.76	30.13	6.41
NYANZA RURAL	267.35	59.29	119.11	45.54	491.30	54.42	12.07	24.24	9.27
South Nyanza	216.90	68.44	104.39	40.20	429.93	50.45	15.92	24.28	9.35
Kisii	374.82	42.18	157.53	24.37	598.91	62.58	7.04	26.30	4.07
Kisumu	192.59	79.48	171.59	74.15	517.81	37.19	15.35	33.14	14.32
Siaya	197.89	63.95	43.49	72.78	378.11	52.34	16.91	11.50	19.25
WESTERN RURAL	375.09	76.59	161.36	97.13	710.18	52.82	10.78	22.72	13.68
Kakamega	312.99	82.23	140.41	118.04	653.68	47.88	12.58	21.48	18.06
Bungoma	604.18	83.27	258.12	62.08	1007.65	59.96	8.26	25.62	6.16
Busia	278.15	36.64	94.15	55.24	464.18	59.92	7.89	20.28	11.90
TOTAL RURAL	444.18	79.33	176.73	66.47	766.71	57.93	10.35	23.05	8.67

Source: The Rural Household Budget Survey Database. Excludes households where monthly expenditure per adult equivalent was less than Shs 30 in 1981/82.

Table 20: Sources of Income by Rural Poverty Group, 1981/82: Absolute Poverty Line

(Shs 105.94)

	ALL	NON-POOR	POOR	ALL (%)	NON-POOR (%)	POOR (%)
Farm enterprise	444.18	538.69	308.04	57.93	56.15	62.98
Non-farm	79.33	100.73	48.50	10.35	10.50	9.92
Salaries/wages	176.73	240.31	85.13	23.05	25.05	17.41
Other income	66.47	79.71	47.40	8.67	8.31	9.69
TOTAL	766.71	959.44	489.08	100.00	100.00	100.00

Table 21: Sources of Income by Rural Poverty Group, 1981/82: Absolute Hard Core Poverty Line

(Shs 87.90)

	ALL	NON-POOR	HARD-CORE POOR	ALL (%)	NON-POOR (%)	HARD-CORE POOR (%)
Farm enterprise	444.18	514.79	275.61	57.93	56.88	63.12
Non-farm	79.33	94.21	43.81	10.35	10.41	10.03
Salaries/wages	176.73	219.39	74.88	23.05	24.24	17.15
Other income	66.47	76.59	42.33	8.67	8.46	9.70
TOTAL	766.71	904.98	436.64	100.00	100.00	100.00

Source: The Rural Household Budget Survey Database. Excludes households where monthly expenditure per adult equivalent was less than Shs 30 in 1981/82.

Table 22: Household Food Expenditure Patterns by Poverty Group, 1981/82: Absolute Poverty Line

(Shs 105.94)

	<u>All</u>	<u>Non-poor</u>		<u>Poor</u>	
	(%)	(%)	%	(%)	(%)
Bread		100.00		81.84	18.16
	2.05		2.38		1.27
Maize		100.00		63.24	36.76
	24.01		21.49		30.05
Cereals		100.00		71.22	28.78
	4.30		4.33		4.21
Meats		100.00		74.80	25.20
	10.21		10.82		8.77
Fish		100.00		62.50	37.50
	1.88		1.66		2.40
Milk products		100.00		73.89	26.11
	12.93		13.53		11.50
Eggs		100.00		84.65	15.35
	0.88		1.05		0.46
Oils and fats		100.00		75.16	24.84
	5.06		5.38		4.28
Fruits		100.00		79.24	20.76
	3.50		3.93		2.48
Vegetables		100.00		65.11	34.89
	6.59		6.07		7.83
Beans		100.00		69.37	30.63
	9.18		9.02		9.57
Roots		100.00		75.93	24.07
	5.52		5.93		4.52
Sugar		100.00		71.32	28.68
	7.58		7.65		7.40
Tea/coffee		100.00		76.94	23.06
	1.93		2.10		1.52
Flavours		100.00		67.50	32.50
	1.14		1.09		1.26
Other		100.00		83.49	16.51
	1.00		1.18		0.56
Beverages		100.00		74.78	25.22
	2.25		2.38		1.93
Total		100.00		70.63	29.37
	100.00		100.00		100.00

Table 23:

Household Non-food Expenditure Patterns by Poverty Group, 1981/82:
Absolute Poverty Line

(Shs 105.94)

	<u>All</u>	<u>Non-poor</u>		<u>Poor</u>	
	(%)	(%)	%	(%)	(%)
Tobacco		100.00		76.16	23.84
	2.98		2.76		4.02
Clothing		100.00		80.61	19.39
	21.92		21.46		24.04
Footwear		100.00		86.39	13.61
	3.84		4.03		2.95
Fuel		100.00		83.49	16.51
	12.38		12.55		11.56
Furniture		100.00		89.55	10.45
	9.12		9.93		5.39
Transport		100.00		86.51	13.49
	9.92		10.42		7.57
Non durables		100.00		72.51	27.49
	13.76		12.12		21.39
Health		100.00		76.74	23.26
	3.42		3.19		4.50
Recreation		100.00		87.22	12.78
	4.11		4.36		2.97
Miscellaneous		100.00		85.77	14.23
	4.11		4.28		3.31
Education		100.00		83.52	16.48
	11.77		11.94		10.97
Licences/insurance		100.00		91.31	8.69
	2.67		2.97		1.31
Total		100.00		82.32	17.68
	100.00		100.00		100.00

Memorandum Items:

	<u>All</u>	<u>Non-poor</u>		<u>Poor</u>	
	(%)	(%)	%	(%)	(%)
Food		100.00		70.63	29.37
	63.20		59.57		74.04
Non-food		100.00		82.32	17.68
	36.80		40.43		25.96
Total		100.00		74.93	25.07
	100.00		100.00		100.00

Table 24: Household Food Expenditure Patterns by Poverty Group, 1981/82: Absolute Hard Core Poverty Line

(Shs 87.90)

	<u>All</u>	<u>"Others"</u>		<u>Poor</u>	
	(%)	(%)	%	(%)	(%)
Bread		100.00		89.50	10.50
	2.05		2.26		1.15
Maize		100.00		75.84	24.16
	24.01		22.41		30.91
Cereals		100.00		80.85	19.15
	4.30		4.27		4.38
Meats		100.00		84.80	15.20
	10.21		10.66		8.27
Fish		100.00		75.21	24.79
	1.88		1.74		2.48
Milk products		100.00		84.39	15.61
	12.93		13.44		10.76
Eggs		100.00		91.41	8.59
	0.88		0.99		0.40
Oils and fats		100.00		84.93	15.07
	5.06		5.29		4.06
Fruits		100.00		87.34	12.66
	3.50		3.77		2.36
Vegetables		100.00		76.37	23.63
	6.59		6.19		8.30
Beans		100.00		80.02	19.98
	9.18		9.04		9.77
Roots		100.00		83.99	16.01
	5.52		5.71		4.71
Sugar		100.00		82.35	17.65
	7.58		7.68		7.13
Tea/coffee		100.00		86.07	13.93
	1.93		2.05		1.43
Flavours		100.00		78.09	21.91
	1.14		1.09		1.33
Other		100.00		90.48	9.52
	1.00		1.11		0.51
Beverages		100.00		82.98	17.02
	2.25		2.29		2.04
Total		100.00		81.23	18.77
	100.00		100.00		100.00

Table 25: Household Non-food Expenditure Patterns by Poverty Group, 1981/82: Absolute Hard Core Poverty Line

(Shs 87.90)

	<u>All</u> (%)	(%)	<u>"Others"</u> %	(%)	<u>Hard Core</u> <u>Poor</u> (%)	(%)
Tobacco	2.98	100.00	2.80	84.03	4.48	15.97
Clothing	21.92	100.00	21.66	88.35	24.06	11.65
Footwear	3.84	100.00	4.00	93.10	2.49	6.90
Fuel	12.38	100.00	12.35	89.22	12.56	10.78
Furniture	9.12	100.00	9.64	94.41	4.81	5.59
Transport	9.92	100.00	10.24	92.26	7.23	7.74
Non durables	13.76	100.00	12.65	82.15	23.14	17.85
Health	3.42	100.00	3.29	85.92	4.54	14.08
Recreation	4.11	100.00	4.25	92.37	2.95	7.63
Miscellaneous	4.11	100.00	4.21	91.48	3.30	8.52
Education	11.77	100.00	12.09	91.81	9.08	8.19
Licences/insurance	2.67	100.00	2.83	94.56	1.37	5.44
Total	100.00	100.00	100.00	89.38	100.00	10.62

Memorandum Items:

	<u>All</u> (%)	(%)	<u>"Others"</u> %	(%)	<u>Poor</u> (%)	(%)
Food	63.20	100.00	60.95	81.23	75.22	18.77
Non-food	36.80	100.00	39.05	89.38	24.78	10.62
Total	100.00	100.00	100.00	84.23	100.00	15.77

Table 26: Household Own Consumption and Purchases of Main Food Items, Rural 1981/82

(Shs/month)

	All			Poor			Non-poor		
	Own consumption	Purchases	Total	Own consumption	Purchases	Total	Own consumption	Purchases	Total
Bread	0.06	6.96	7.02	0.05	3.02	3.07	0.07	9.43	9.49
Maize	47.38	34.99	82.37	45.03	28.24	73.26	48.86	39.22	88.07
Cereals	5.56	9.20	14.76	6.32	4.30	10.62	5.08	12.28	17.36
Fish	0.48	5.95	6.44	0.41	5.56	5.98	0.53	6.20	6.73
Meats	7.69	27.27	34.95	5.52	15.69	21.21	9.05	34.52	43.57
Milk	30.26	14.03	44.29	20.10	7.56	27.66	36.62	18.09	54.72
Eggs	2.06	0.94	3.00	0.85	0.23	1.08	2.81	1.39	4.20
Oils & Fats	0.52	16.78	17.30	0.41	9.99	10.40	0.58	21.03	21.62
Fruits	7.64	4.34	11.98	3.67	2.12	5.79	10.13	5.73	15.86
Vegetables	15.02	7.58	22.60	13.75	5.36	19.11	15.82	8.97	24.79
Beans	23.61	7.84	31.45	18.26	4.85	23.11	26.96	9.71	36.67
Roots	13.60	5.33	18.93	8.49	2.73	11.22	16.81	6.95	23.76
Sugar	0.23	25.71	25.94	0.15	17.79	17.94	0.28	30.67	30.95
Flavours	0.33	3.57	3.91	0.24	2.84	3.08	0.39	4.03	4.42
Other	0.10	3.33	3.42	0.08	1.30	1.38	0.11	4.59	4.70
Total	154.53	173.82	328.34	123.34	111.58	234.93	174.08	212.83	386.90

Per Cent

Bread	0.86	99.14	100.00	1.72	98.28	100.00	0.69	99.31	100.00
Maize	57.52	42.48	100.00	61.46	38.54	100.00	55.47	44.53	100.00
Cereals	37.65	62.35	100.00	59.48	40.52	100.00	29.27	70.73	100.00
Fish	7.52	92.48	100.00	6.91	93.09	100.00	7.86	92.14	100.00
Meats	22.00	78.00	100.00	26.03	73.97	100.00	20.76	79.24	100.00
Milk	68.31	31.69	100.00	72.67	27.33	100.00	66.93	33.07	100.00
Eggs	68.59	31.41	100.00	78.97	21.03	100.00	66.91	33.09	100.00
Oils & Fats	2.99	97.01	100.00	3.95	96.05	100.00	2.70	97.30	100.00
Fruits	63.77	36.23	100.00	63.33	36.67	100.00	63.87	36.13	100.00
Vegetables	66.46	33.54	100.00	71.96	28.04	100.00	63.81	36.19	100.00
Beans	75.07	24.93	100.00	79.02	20.98	100.00	73.51	26.49	100.00
Roots	71.86	28.14	100.00	75.67	24.33	100.00	70.73	29.27	100.00
Sugar	0.89	99.11	100.00	0.86	99.14	100.00	0.90	99.10	100.00
Flavours	8.54	91.46	100.00	7.92	92.08	100.00	8.82	91.18	100.00
Other	2.79	97.21	100.00	5.76	94.24	100.00	2.24	97.76	100.00
Total	47.06	52.94	100.00	52.50	47.50	100.00	44.99	55.01	100.00

Note: "Purchases" includes "gifts-in", but the latter was insignificant for all food items listed above.

Table 27: Distribution of Rural Households by Holding Size, 1981/82

Holding (acres)	0	<1	1-1.99	2-2.99	3-3.99	4-4.99	5-6.99	7-9.99	10-19.99	>20	Cumulative (%)	Share (%)	Mean Holding Size (excluding >50)	Mean Holding Size
Total Rural	11.93	4.92	12.71	15.59	12.05	8.18	11.71	8.06	9.49	5.37	100.00	100.00	4.92	32.38
Coast	16.02	4.51	5.76	13.60	11.19	10.21	12.30	9.07	11.10	6.24	100.00	8.11	5.19	6.40
Eastern	5.18	0.68	8.22	13.90	11.56	7.63	15.39	12.21	17.10	8.14	100.00	19.66	6.87	8.00
Central	9.81	16.89	24.12	14.67	9.29	6.55	7.83	5.15	3.71	2.00	100.00	18.61	2.99	3.29
Rift Valley	23.54	4.11	11.34	14.87	9.47	5.89	8.32	5.31	9.54	7.60	100.00	22.63	4.86	7.40
Nyanza	10.56	0.72	6.41	14.77	17.81	12.05	16.85	9.14	8.68	3.01	100.00	17.83	4.90	30.15
Western	4.41	1.65	18.45	22.98	13.83	8.71	10.18	8.61	6.31	4.86	100.00	13.17	4.72	171.82
Male	13.60	3.94	11.34	13.16	11.90	8.16	12.42	8.37	10.56	6.54	100.00	69.84	5.34	38.40
Male-married	12.12	3.71	10.88	13.29	12.22	8.14	13.04	8.54	11.14	6.91	100.00	63.38	5.55	41.86
Male-other	28.06	6.28	15.89	11.93	8.78	8.31	6.33	6.70	4.89	2.84	100.00	6.46	3.32	4.43
Female	8.12	7.11	16.00	21.13	12.47	8.35	9.97	7.35	6.81	2.69	100.00	30.16	3.91	19.14
Female-married	6.51	5.60	14.54	21.80	14.59	9.03	9.72	7.48	7.99	2.75	100.00	16.09	4.15	32.42
Female-other	9.96	8.83	17.68	20.37	10.04	7.57	10.25	7.21	5.47	2.63	100.00	14.07	3.64	3.95

Note: The mean holding size includes households with "no holding", i.e. landless.

Table 28: Household Ownership of Selected Assets by Region, 1981/82

PROVINCE	Average Livestock per Holding			
	cattle	sheep	goats	donkeys
Coast	1.67	0.83	3.20	0.00
Eastern	3.25	1.50	4.13	0.09
Central	1.96	1.16	0.78	0.02
Rift Valley	7.35	4.03	4.56	0.27
Nyanza	3.05	0.77	1.29	0.05
Western	2.38	0.53	0.54	0.00
TOTAL	3.66	1.70	2.55	0.09

PROVINCE	Selected Farm Tools per Holding				
	Pangas	Jembes	Axes	Shovels	Buckets
Coast	1.79	3.75	0.72	0.17	1.93
Eastern	2.76	2.82	0.71	0.51	0.35
Central	2.93	2.88	0.77	0.55	0.69
Rift Valley	1.75	2.36	0.68	0.15	0.75
Nyanza	1.67	2.60	0.52	0.10	0.71
Western	1.64	2.95	0.71	0.19	0.92
TOTAL	2.14	2.78	0.68	0.29	0.77

PROVINCE	Selected Durable Farm Equipment per Thousand Households					
	Carts	Burrows	Ploughs	Sprayers	Water Tanks	Bicycles
Coast	4.82	37.21	21.48	25.77	111.60	135.02
Eastern	47.13	133.87	277.46	137.05	110.85	119.59
Central	28.70	125.14	34.68	150.52	316.12	120.16
Rift Valley	15.58	31.74	121.14	41.34	107.06	85.63
Nyanza	2.43	52.04	187.91	11.62	35.08	120.71
Western	30.56	62.19	157.91	12.20	71.31	187.13
TOTAL	22.98	77.27	144.45	70.07	129.53	122.35

PROVINCE	Motor Vehicles and Tractors per thousand households			
	Cars	Lorries	Motor Cycles	Tractors
Coast	0.00	0.00	10.03	4.59
Eastern	4.23	6.59	8.20	0.52
Central	8.50	14.02	5.30	1.73
Rift Valley	7.34	4.77	7.99	6.03
Nyanza	3.65	2.08	3.66	2.04
Western	1.18	7.31	1.43	6.21
Total	4.88	6.32	6.06	3.34

Table 29: Housing Characteristics, Rural 1981/82 (%)

<u>Structures by Roof type</u>							
	Coast	Eastern	Central	Rift/V	Nyanza	Western	Total
Thatched roof	84.04	65.20	23.21	70.22	82.18	87.11	68.41
Corrugated iron roofs	10.44	34.37	62.14	22.41	17.79	12.42	27.28
Tile roof structure	0.17	0.00	0.09	0.13	0.00	0.15	0.08
Asbestos roof structure	0.39	0.04	0.98	0.00	0.03	0.32	0.24
Tin roof structure	0.72	0.36	12.56	0.41	0.00	0.00	2.07
Other roofed structures	4.23	0.03	1.02	6.83	0.00	0.00	1.93
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00

<u>Structures by wall type</u>							
	Coast	Eastern	Central	Rift/V	Nyanza	Western	Total
Mud wall structures	80.32	65.03	65.82	79.55	93.70	95.69	79.89
Wood wall structures	0.73	7.40	23.12	10.32	1.22	0.53	7.45
Stone wall structures	1.44	3.59	7.32	3.94	2.21	1.44	3.42
Brick wall structures	1.82	19.70	0.39	0.49	0.65	1.00	4.67
Mud cement wall structures	3.13	2.60	1.17	1.01	1.66	1.18	1.71
Other walled structures	12.56	1.67	2.18	4.69	0.56	0.15	2.87
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00

<u>Structures with piped water</u>							
	Coast	Eastern	Central	Rift/V	Nyanza	Western	Total
Structures with piped water	2.23	0.98	3.64	3.92	2.34	0.90	2.35
Without piped water	97.77	99.02	96.36	96.08	97.66	99.10	97.65
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00

<u>Structures with water closet</u>							
	Coast	Eastern	Central	Rift/V	Nyanza	Western	Total
Structures with water closet	1.34	0.71	1.37	0.72	0.63	0.99	0.89
Without water closet	98.66	99.29	98.63	99.28	99.37	99.01	99.11
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Table 30: Distance to water in wet season, Rural 1981/82 (km)

	Coast	Eastern	Central	Rift/V	Nyanza	Western	Total
Less than 1 km.	22.22	55.53	72.89	67.37	52.97	48.22	57.32
1-2.99 km.	67.03	39.25	24.74	27.32	44.61	48.89	38.33
3-4.99 km.	9.29	3.37	0.82	2.26	1.91	2.88	2.80
5-8.99 km.	1.40	1.70	1.47	1.36	0.42	0.00	1.10
9-11.99 km.	0.06	0.15	0.07	0.52	0.08	0.00	0.18
12 km and above	0.00	0.00	0.00	1.17	0.00	0.00	0.26
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Table 31: Average Distance to Selected Amenities, Rural 1981/82 (km)

	Water in wet season	Bus route	Dirt road	All weather road	Tarmac road	Market place
COAST	1.21	2.76	3.01	6.15	10.41	6.74
Kilifi, Tana & Lamu	1.40	2.68	1.12	8.10	9.49	6.28
Kwale	0.85	2.56	7.35	4.59	11.01	5.53
Taita Taveta	1.18	3.32	1.61	2.72	12.22	10.15
EASTERN	0.69	3.03	1.65	5.93	17.19	6.76
Machakos	0.52	3.39	2.18	7.80	20.74	7.63
Kitui	0.97	3.87	2.22	7.00	1.47	8.18
Meru	0.84	2.61	0.92	3.92	22.68	5.72
Embu	0.32	1.46	0.91	3.27	16.91	4.21
CENTRAL	0.38	1.16	0.33	1.64	5.68	5.57
Nyeri	0.36	0.89	0.34	2.32	6.44	6.36
Murang'a	0.26	0.98	0.38	1.81	4.10	3.87
Kirinyaga	0.27	1.42	0.24	1.80	5.16	4.23
Kiambu	0.57	1.22	0.22	0.68	3.15	6.79
Nyandarua	0.34	1.72	0.61	2.60	17.88	7.14
RIFT VALLEY	0.76	3.95	1.48	4.99	15.95	9.13
Nakuru	1.64	3.22	1.15	3.42	14.17	12.04
Nandi	0.34	2.33	0.90	4.38	12.27	7.41
Kajiado, Narok	1.74	8.06	2.34	10.72	24.04	17.82
Kericho	0.30	2.30	1.50	4.10	16.22	6.75
Uasin Gishu	0.24	2.27	0.89	1.88	6.24	8.23
Trans Nzoia	0.28	1.95	0.44	0.98	8.66	2.64
Baringo, Laikipia	0.49	5.85	2.51	8.79	26.27	8.26
W. Pokot/Elgeyo M.	0.56	6.13	1.78	5.40	15.96	7.58
NYANZA	0.59	2.32	1.15	2.57	14.29	2.87
South Nyanza	0.72	3.16	1.66	3.94	23.82	2.93
Kisii	0.41	1.51	0.92	2.21	14.06	3.11
Kisumu	0.49	2.24	0.24	1.00	4.41	2.40
Siaya	0.77	2.58	1.36	2.15	6.93	2.64
WESTERN	0.67	2.77	0.70	2.00	9.76	4.56
Kakamega	0.59	2.46	0.45	1.40	6.39	4.66
Bungoma	0.98	3.61	1.07	3.53	16.49	5.29
Busia	0.51	2.84	1.31	2.33	14.63	2.75
NATION	0.67	2.71	1.26	3.82	12.72	6.09

Table 32: Decomposition of P α Food Poverty Measures by Region, 1992

(Shs 404.66)

	P α =0	P α =0	P α =1	P α =2	%of pop.	Contribution to national poverty (%)		
	adulteq	hholds	adulteq	adulteq		P α =0	P α =1	P α =2
COAST RURAL	63.00	53.80	26.06	14.49	5.91	5.19	4.52	4.15
Kilifi	69.37	55.14	30.74	18.57	2.21	2.13	1.99	1.99
Kwale/T. Taveta	64.87	57.34	24.74	12.16	2.58	2.33	1.87	1.52
Lamu/Tana River	46.22	40.17	19.90	11.84	1.12	0.72	0.66	0.64
EASTERN RURAL	62.31	55.15	22.84	11.69	19.38	16.82	13.01	10.99
Embu	61.57	54.07	26.29	15.27	1.65	1.41	1.27	1.22
Kisui	71.97	66.90	27.81	13.79	3.31	3.32	2.70	2.21
Machakos/Makueni	61.85	53.34	19.64	9.28	7.50	6.46	4.33	3.38
Meru/Tharaka	58.36	51.73	23.12	12.44	6.92	5.63	4.70	4.18
CENTRAL RURAL	67.83	57.75	27.91	14.77	16.66	15.74	13.66	11.93
Kiambu	65.29	54.59	23.70	11.15	5.37	4.88	3.74	2.90
Kirinyaga	71.51	61.09	31.21	17.35	1.79	1.78	1.64	1.50
Murang'a	68.48	59.24	27.88	15.17	4.71	4.49	3.86	3.46
Nyandarua	72.81	58.10	28.50	14.45	1.66	1.69	1.39	1.17
Nyeri	66.46	58.39	33.01	19.05	3.13	2.90	3.03	2.89
RIFT/V RURAL	81.02	72.05	44.98	29.90	24.17	27.28	31.94	35.04
Kajiado/Narok	46.80	32.28	16.39	8.23	2.64	1.72	1.27	1.06
Kericho/Bomet	93.93	90.81	58.38	40.34	5.62	7.35	9.64	10.99
Laikipia	76.96	68.45	34.17	18.97	1.01	1.08	1.01	0.93
Nakuru	73.61	57.53	36.54	23.63	3.84	3.94	4.13	4.41
Nandi	88.13	79.53	48.60	31.00	2.54	3.12	3.63	3.82
Baringo	73.23	63.16	35.62	20.86	1.27	1.30	1.33	1.29
E. Marakwet	82.56	81.70	46.72	29.82	1.10	1.26	1.51	1.59
Trans Nzoia/U. Gishu	87.64	84.35	52.18	36.40	4.90	5.98	7.51	8.65
W. Pokot	87.76	80.93	52.44	38.49	1.24	1.52	1.91	2.32
NYANZA RURAL	70.72	63.52	34.82	21.56	19.09	18.80	19.53	19.96
Kisii	84.80	81.86	44.65	27.94	4.57	5.40	5.99	6.19
Kisumu	51.81	43.37	20.29	10.65	2.65	1.91	1.58	1.37
Siaya	55.85	48.68	23.97	13.65	4.24	3.30	2.98	2.81
Homa Bay/Migori	76.92	71.04	36.46	22.40	5.55	5.94	5.94	6.02
Nyamira	77.58	71.33	49.46	35.25	2.09	2.25	3.03	3.57
WESTERN RURAL	78.41	74.21	39.86	24.98	14.80	16.17	17.33	17.93
Bungoma	79.91	78.53	45.33	30.74	4.58	5.09	6.10	6.82
Busia	88.79	87.07	50.82	34.52	2.71	3.36	4.05	4.54
Kakamega/Vihiga	73.74	67.28	32.56	18.02	7.51	7.72	7.19	6.56
TOTAL RURAL	71.78	63.83	34.03	20.62	100.00	100.00	100.00	100.00

Source: Welfare Monitoring Survey, 1992 database.

Table 33: Provincial Adult Equivalent Expenditure Percentiles Relative to Rural Household Deciles, 1992

NATION (Shs)	206.36	300.03	378.84	471.14	573.37	693.15	867.01	1158.14	1757.92	29,086.59
(By households)	10.00	20.00	30.00	40.00	50.00	60.00	70.00	80.00	90.00	100.00
COAST RURAL	8.78	18.16	29.02	41.08	52.55	65.80	75.80	87.96	94.81	100.00
Kilifi	11.29	22.26	30.74	45.71	55.49	68.19	76.66	89.52	94.86	100.00
Kwale/T. Taveta	7.11	17.81	33.63	46.49	58.11	71.43	81.05	88.31	94.73	100.00
Lamu/Tana River	7.65	10.92	15.04	19.57	33.99	48.19	62.06	84.09	94.89	100.00
EASTERN RURAL	8.25	16.65	28.87	41.06	51.39	63.97	76.19	85.64	93.87	100.00
Embu	13.00	19.00	31.45	41.72	59.34	68.14	77.32	86.19	93.87	100.00
Kitui	8.14	18.68	40.18	57.36	65.90	74.31	83.95	91.46	97.05	100.00
Machakos/Makueni	8.92	18.47	31.25	42.40	53.28	71.22	85.07	92.05	97.29	100.00
Meru/Tharaka	6.44	13.17	20.27	31.66	40.50	50.18	62.60	75.79	88.64	100.00
CENTRAL RURAL	5.47	13.65	24.37	34.96	44.98	56.63	67.52	80.00	91.29	100.00
Kiambu	3.87	15.84	25.11	32.31	42.56	55.30	66.73	80.06	92.80	100.00
Kirinyaga	6.26	13.92	29.20	39.31	52.58	59.79	67.27	76.26	89.21	100.00
Murang'a	7.06	13.74	23.10	36.62	44.29	59.22	70.26	80.63	91.59	100.00
Nyandarua	3.48	9.35	17.41	33.43	46.07	58.65	68.79	84.16	92.14	100.00
Nyeri	6.44	11.90	25.96	35.31	45.23	52.15	64.24	78.87	88.98	100.00
RIFT/V RURAL	14.96	29.73	39.81	49.46	59.22	68.12	75.44	83.93	93.04	100.00
Kajiado/Narok	4.79	9.10	19.25	22.55	31.46	38.93	49.99	66.53	84.30	100.00
Kericho/Bomet	17.08	40.15	49.78	63.40	71.62	79.55	85.00	91.03	98.01	100.00
Laikipia	9.29	15.38	26.80	33.35	45.84	57.62	69.27	83.23	94.21	100.00
Nakuru	17.69	32.05	37.89	47.37	54.03	68.52	72.08	79.74	92.62	100.00
Nandi	8.41	28.33	46.12	58.61	68.62	76.60	82.76	91.26	96.63	100.00
Baringo	5.10	13.49	25.78	44.32	51.19	56.60	68.77	78.22	87.39	100.00
E. Marakwet	10.70	27.02	42.72	50.52	57.85	66.26	73.70	86.46	91.50	100.00
Trans Nzoia/U. Gishu	20.09	32.97	40.48	45.91	61.01	68.67	77.92	84.28	91.59	100.00
W. Pokot	30.28	39.99	51.26	62.99	72.25	79.80	85.41	89.71	95.05	100.00
NYANZA RURAL	13.69	26.69	37.03	45.81	57.43	66.07	76.44	84.48	92.08	100.00
Kisii	15.40	28.13	38.88	44.34	55.67	66.90	76.30	86.35	94.62	100.00
Kisumu	9.42	19.59	30.40	37.66	50.02	57.54	69.55	82.74	91.88	100.00
Siaya	7.94	20.84	29.84	38.85	49.98	61.97	71.15	76.84	86.31	100.00
Homa Bay/Migori	17.82	30.93	42.52	53.80	65.83	70.86	84.51	91.17	96.32	100.00
Nyamira	16.01	33.14	41.39	52.31	63.45	70.61	74.79	80.30	87.19	100.00
WESTERN RURAL	14.06	29.33	42.19	53.04	63.07	72.90	81.37	89.58	95.71	100.00
Bungoma	19.75	31.97	43.08	52.98	58.83	66.89	75.98	85.37	92.81	100.00
Busia	23.55	44.76	59.70	67.17	73.86	81.28	88.51	94.44	97.31	100.00
Kakamega/Vihiga	7.17	22.15	35.33	47.97	61.75	73.53	82.07	90.40	96.90	100.00
TOTAL RURAL	11.34	23.19	34.30	44.76	55.16	65.58	75.36	84.79	93.22	100.00
(By adult equivalents)										

Source: Welfare Monitoring Survey, 1992 database.

Table 34: Provincial Adult Equivalent Expenditure Percentiles Relative to Rural National Adult Equivalent Deciles, 1992

TOTAL RURAL (Shs)	9.96	19.99	30.00	40.02	49.99	60.00	69.98	79.98	90.01	100.00
	194.02	277.16	345.34	430.81	522.47	625.41	765.45	986.29	1460.24	29,086.59
COAST RURAL	7.87	14.85	25.23	36.73	48.12	57.07	71.11	80.65	92.46	100.00
Kilifi	10.02	19.13	26.85	41.76	50.78	56.23	73.40	80.61	92.63	100.00
Kwale/T. Taveta	6.12	13.49	28.28	40.27	53.99	63.64	77.19	84.76	92.38	100.00
Lamu/Tana River	7.65	9.55	15.04	18.75	29.43	43.62	52.64	71.31	92.30	100.00
EASTERN RURAL	6.93	14.10	23.89	34.91	46.22	55.98	69.43	82.45	91.21	100.00
Embu	11.52	17.99	26.96	37.27	51.36	62.85	71.65	83.40	92.08	100.00
Kisii	7.30	15.63	31.85	49.74	62.37	67.69	78.93	87.65	93.96	100.00
Machakos/Makueni	6.48	15.20	25.82	36.69	48.22	60.04	78.26	89.93	96.04	100.00
Meru/Tharaka	6.15	11.26	17.27	25.35	35.13	44.36	54.80	71.63	84.47	100.00
CENTRAL RURAL	3.77	10.49	21.08	30.86	40.31	50.76	61.56	73.04	86.95	100.00
Kiambu	2.47	11.40	23.08	29.16	37.82	48.84	60.49	72.01	86.93	100.00
Kirinyaga	5.39	11.88	27.74	34.01	44.64	57.27	64.50	70.30	85.20	100.00
Murang'a	4.17	10.43	20.86	30.29	41.43	51.37	64.89	75.67	87.10	100.00
Nyandarua	1.55	7.82	12.75	29.45	40.04	52.68	64.06	75.54	89.31	100.00
Nyeri	5.66	9.62	18.59	33.55	40.55	48.37	55.36	71.08	86.49	100.00
RIFT/V RURAL	14.05	25.80	35.55	45.18	53.95	63.47	71.63	79.13	90.29	100.00
Kajiado/Narok	4.79	7.35	13.65	20.53	27.58	34.68	43.68	56.42	75.44	100.00
Kericho/Bomet	15.22	34.47	45.30	56.74	67.23	76.72	81.29	87.37	96.92	100.00
Laikipia	8.31	13.06	23.08	29.72	38.82	48.81	63.23	77.16	91.79	100.00
Nakuru	17.54	27.27	36.95	43.06	50.50	59.53	70.11	75.15	89.34	100.00
Nandi	7.93	22.52	38.23	55.71	63.09	71.68	79.25	86.46	95.07	100.00
Baringo	4.58	11.24	20.78	31.09	47.67	53.61	60.42	70.95	85.62	100.00
E. Marakwet	10.35	21.27	35.33	48.34	55.79	59.96	69.44	80.00	90.26	100.00
Trans Nzoia/U. Gishu	18.68	30.90	37.56	43.84	51.92	66.13	75.43	81.38	88.90	100.00
W. Pokot	29.52	37.13	45.84	59.94	67.19	74.86	81.76	87.83	94.21	100.00
NYANZA RURAL	11.58	23.59	32.17	40.97	51.82	61.71	69.86	80.38	88.44	100.00
Kisii	13.56	23.96	33.38	41.50	50.36	61.57	70.28	81.15	91.38	100.00
Kisumu	9.42	14.68	24.96	33.76	43.82	54.04	63.61	75.78	88.98	100.00
Siaya	7.43	18.56	25.95	34.41	44.27	54.60	66.24	74.51	82.24	100.00
Homa Bay/Migori	13.31	28.70	37.04	46.87	59.95	68.25	74.25	87.64	92.51	100.00
Nyamira	13.82	30.71	38.38	46.60	58.91	68.84	72.55	77.17	83.08	100.00
WESTERN RURAL	12.95	26.34	38.08	48.67	57.75	68.95	77.20	85.18	92.47	100.00
Bungoma	18.67	28.56	40.71	48.50	56.70	64.14	72.11	78.65	89.85	100.00
Busia	20.70	42.37	57.84	62.18	69.80	76.62	85.19	90.75	95.47	100.00
Kakamega/Vihiga	6.66	19.19	29.33	43.90	54.04	69.10	77.42	87.14	92.98	100.00

Table 35: Decomposition of P α Poverty Measures by Region, 1992, based on Absolute Poverty Line

(Shs 484.98)

	P α =0	P α =0	P α =1	P α =2	% of pop.	Contribution to national poverty (%)		
	adulteq	hholds	adulteq	adulteq		P α =0	P α =1	P α =2
COAST RURAL	43.50	37.90	15.38	7.63	5.91	5.55	4.95	4.62
Kilifi	48.05	36.94	17.44	8.75	2.21	2.29	2.10	1.98
Kwale/T. Taveta	49.56	45.15	16.29	7.62	2.58	2.76	2.29	2.02
Lamu/Tana River	20.62	18.57	9.25	5.46	1.12	0.50	0.57	0.63
EASTERN RURAL	42.16	38.08	14.93	7.42	19.38	17.64	15.75	14.74
Embu	44.52	39.73	17.50	9.59	1.65	1.58	1.57	1.62
Kiui	58.21	55.13	19.55	9.04	3.31	4.16	3.52	3.07
Machakos/Makueni	43.32	36.78	15.70	7.67	7.50	7.01	6.41	5.90
Meru/Tharaka	32.68	30.94	11.28	5.84	6.92	4.88	4.25	4.15
CENTRAL RURAL	35.89	31.21	12.09	5.43	16.66	12.90	10.96	9.27
Kiambu	32.68	28.33	11.87	5.27	5.37	3.79	3.47	2.90
Kirinyaga	41.85	35.77	14.20	6.47	1.79	1.62	1.38	1.19
Murang'a	37.30	33.83	12.17	5.61	4.71	3.79	3.12	2.71
Nyandarua	36.67	25.17	9.82	3.93	1.66	1.32	0.89	0.67
Nyeri	35.44	32.36	12.34	5.62	3.13	2.39	2.10	1.80
RIFT/V RURAL	51.51	44.54	22.29	12.69	24.17	26.87	29.33	31.46
Kajiado/Narok	25.11	17.88	8.63	4.10	2.64	1.43	1.24	1.11
Kericho/Bomet	64.70	61.39	27.87	15.39	5.62	7.84	8.52	8.87
Laikipia	34.37	30.44	13.71	7.35	1.01	0.75	0.75	0.76
Nakuru	47.70	33.66	22.22	12.76	3.84	3.96	4.65	5.03
Nandi	59.05	48.49	22.60	10.76	2.54	3.24	3.13	2.80
Baringo	46.43	38.18	13.27	6.11	1.27	1.27	0.92	0.80
E. Marakwet	52.89	50.55	20.97	10.68	1.10	1.26	1.26	1.20
Trans Nzoia/U. Gishu	50.80	48.39	24.26	15.18	4.90	5.37	6.47	7.63
W. Pokot	65.22	61.49	35.36	25.56	1.24	1.75	2.39	3.25
NYANZA RURAL	47.41	43.37	19.73	10.64	19.09	19.53	20.50	20.83
Kisii	46.09	45.81	20.52	11.52	4.57	4.54	5.10	5.40
Kisumu	39.06	34.94	15.12	7.71	2.65	2.23	2.18	2.09
Siaya	40.19	34.18	15.39	7.70	4.24	3.68	3.55	3.34
Homa Bay/Migori	55.67	50.81	23.37	12.86	5.55	6.66	7.06	7.31
Nyamira	53.65	51.07	23.01	12.53	2.09	2.42	2.61	2.68
WESTERN RURAL	54.81	53.45	22.97	12.57	14.80	17.51	18.51	19.08
Bungoma	54.81	56.11	25.16	15.16	4.58	5.41	6.27	7.11
Busia	67.66	65.76	33.26	19.58	2.71	3.96	4.91	5.45
Kakamega/Vihiga	50.17	47.59	17.91	8.46	7.51	8.13	7.32	6.52
TOTAL RURAL	46.33	41.51	18.37	9.75	100.00	100.00	100.00	100.00

Source: Welfare Monitoring Survey, 1992 database.

Table 36: Decomposition of P_α Poverty Measures by Region, 1992, based on Absolute Hard Core Poverty Line

(Shs 404.66)

	P _α =0	P _α =0	P _α =1	P _α =2	% of pop.	Contribution to national poverty (%)		
	adulteq	hholds	adulteq	adulteq		P _α =0	P _α =1	P _α =2
COAST RURAL	32.80	27.39	10.88	5.20	5.91	5.18	4.69	4.41
Kilifi	36.38	26.72	12.45	6.01	2.21	2.15	2.00	1.90
Kwale/T. Taveta	36.27	31.92	11.11	4.94	2.58	2.50	2.09	1.83
Lamu/Tana River	17.83	15.51	7.29	4.21	1.12	0.54	0.60	0.68
EASTERN RURAL	32.19	29.09	10.48	5.09	19.38	16.67	14.81	14.14
Embu	36.22	31.26	13.13	7.06	1.65	1.59	1.58	1.67
Kimii	44.71	41.36	13.01	5.84	3.31	3.95	3.14	2.77
Machakos/Makueni	34.68	29.15	11.06	5.16	7.50	6.95	6.05	5.55
Meru/Tharaka	22.54	22.71	8.03	4.19	6.92	4.17	4.05	4.16
CENTRAL RURAL	28.07	24.20	8.09	3.37	16.66	12.50	9.83	8.04
Kiambu	27.67	22.99	8.19	3.16	5.37	3.97	3.21	2.43
Kirinyaga	32.28	28.85	9.77	4.04	1.79	1.54	1.27	1.04
Murang'a	26.69	24.24	8.16	3.62	4.71	3.36	2.80	2.44
Nyandarua	25.60	17.21	5.65	2.25	1.66	1.14	0.69	0.54
Nyeri	29.74	27.09	8.15	3.55	3.13	2.49	1.86	1.59
RIFT/V RURAL	42.91	36.20	17.40	9.53	24.17	27.72	30.66	33.03
Kajiado/Narok	20.53	14.15	6.07	2.65	2.64	1.45	1.17	1.01
Kericho/Bomet	53.65	49.59	21.55	11.28	5.62	8.06	8.83	9.09
Laikipia	27.42	23.45	10.28	5.30	1.01	0.74	0.76	0.77
Nakuru	38.69	23.75	17.79	9.56	3.84	3.98	4.99	5.27
Nandi	52.53	42.69	15.82	6.98	2.54	3.57	2.93	2.54
Baringo	28.94	26.49	8.68	4.02	1.27	0.98	0.80	0.73
E. Marakwet	47.34	44.39	15.36	7.34	1.10	1.39	1.23	1.16
Trans Nzoia/U. Gishu	43.55	41.43	20.16	12.07	4.90	5.70	7.20	8.48
W. Pokot	55.83	52.85	30.36	22.34	1.24	1.85	2.75	3.98
NYANZA RURAL	39.11	34.79	15.14	7.64	19.09	19.95	21.07	20.92
Kisii	40.88	39.90	16.13	8.50	4.57	4.99	5.37	5.57
Kisumu	32.26	27.37	11.12	5.31	2.65	2.28	2.15	2.02
Siaya	32.72	27.57	11.32	5.20	4.24	3.71	3.50	3.16
Homa Bay/Migori	44.12	38.58	18.12	9.39	5.55	6.54	7.33	7.47
Nyamira	43.63	42.11	17.91	9.03	2.09	2.43	2.72	2.70
WESTERN RURAL	45.42	42.93	17.56	9.17	14.80	17.97	18.95	19.46
Bungoma	44.44	45.67	20.25	11.83	4.58	5.44	6.76	7.76
Busia	60.15	57.10	27.16	14.88	2.71	4.36	5.37	5.79
Kakamega/Vihiga	40.69	36.34	12.44	5.48	7.51	8.17	6.81	5.91
TOTAL RURAL	37.41	32.82	13.71	6.97	100.00	100.00	100.00	100.00

Source: Welfare Monitoring Survey, 1992 database.

Table 37: Decomposition of P α Poverty Measures by Region, 1992, based on Relative Poverty Line

(2/3 of the rural mean: Shs 596.43)

	P α =0	P α =0	P α =1	P α =2	% of pop.	Contribution to national poverty (%)		
	adulteq	hholds	adulteq	adulteq		P α =0	P α =1	P α =2
COAST RURAL	54.05	46.29	21.73	11.38	5.91	5.59	5.21	4.88
Kilifi	56.23	42.45	23.85	12.84	2.21	2.17	2.14	2.06
Kwale/T. Taveta	59.77	54.18	23.62	11.87	2.58	2.70	2.47	2.22
Lamu/Tana River	36.66	31.82	13.25	7.40	1.12	0.72	0.60	0.60
EASTERN RURAL	53.55	49.31	21.12	11.05	19.38	18.17	16.61	15.54
Embu	59.78	53.53	24.29	13.44	1.65	1.72	1.62	1.60
Kinai	66.15	62.85	27.76	14.09	3.31	3.83	3.73	3.38
Machakos/Makueni	57.60	51.90	22.09	11.50	7.50	7.57	6.73	6.26
Meru/Tharaka	41.66	39.29	16.13	8.54	6.92	5.05	4.53	4.29
CENTRAL RURAL	47.46	41.58	17.67	8.66	16.66	13.84	11.95	10.47
Kiambu	45.07	38.48	17.08	8.41	5.37	4.24	3.72	3.28
Kirinyaga	55.07	46.62	20.45	10.16	1.79	1.72	1.48	1.32
Murang'a	47.97	44.92	17.83	8.83	4.71	3.96	3.41	3.02
Nyandarua	47.07	35.73	15.81	6.98	1.66	1.37	1.07	0.84
Nyeri	46.63	41.53	17.86	8.86	3.13	2.55	2.27	2.01
RIFT/V RURAL	60.83	53.01	28.61	17.07	24.17	25.74	28.07	29.94
Kajiado/Narok	32.44	24.02	12.45	6.30	2.64	1.50	1.34	1.21
Kericho/Bomet	73.00	69.98	35.47	20.98	5.62	7.18	8.09	8.56
Laikipia	47.45	43.74	18.91	10.40	1.01	0.84	0.77	0.76
Nakuru	57.08	41.44	27.79	16.96	3.84	3.84	4.34	4.73
Nandi	69.03	59.98	30.51	16.18	2.54	3.07	3.15	2.98
Baringo	52.50	44.41	20.06	9.76	1.27	1.17	1.04	0.90
E. Marakwet	57.85	56.83	27.56	15.37	1.10	1.11	1.23	1.23
Trans Nzoia/U. Gishu	63.31	58.12	30.31	19.30	4.90	5.43	6.03	6.87
W. Pokot	73.26	67.58	41.53	29.98	1.24	1.59	2.09	2.70
NYANZA RURAL	58.90	55.52	26.11	14.84	19.09	19.69	20.23	20.56
Kisii	57.55	57.43	26.54	15.63	4.57	4.60	4.92	5.18
Kisumu	52.48	48.03	20.87	11.22	2.65	2.43	2.24	2.16
Siaya	50.80	47.09	21.21	11.33	4.24	3.77	3.65	3.48
Homa Bay/Migori	66.37	62.58	30.55	17.69	5.55	6.45	6.88	7.12
Nyamira	66.63	62.15	30.00	17.31	2.09	2.43	2.54	2.62
WESTERN RURAL	65.44	63.98	29.84	17.31	14.80	16.96	17.93	18.60
Bungoma	60.79	62.23	31.16	19.63	4.58	4.87	5.79	6.52
Busia	75.44	74.08	40.43	25.50	2.71	3.59	4.45	5.02
Kakamega/Vihiga	64.66	61.23	25.22	12.94	7.51	8.50	7.69	7.05
TOTAL RURAL	57.11	51.87	24.64	13.78	100.00	100.00	100.00	100.00

Source: Welfare Monitoring Survey, 1992 database.

Table 38: Decomposition of P α Poverty Measures by Region, 1992, based on Relative Poverty Line

(Median consumption expenditure: Shs 573.37)

	P α =0	P α =0	P α =1	P α =2	% of pop.	Contribution to national poverty (%)		
	adulteq	hholds	adulteq	adulteq		P α =0	P α =1	P α =2
COAST RURAL	52.55	44.68	20.46	10.59	5.91	5.63	5.17	4.84
Kilifi	55.49	41.68	22.56	11.99	2.21	2.22	2.13	2.05
Kwale/T. Taveta	58.11	52.56	22.19	10.96	2.58	2.72	2.45	2.19
Lamu/Tana River	33.99	28.30	12.35	6.96	1.12	0.69	0.59	0.60
EASTERN RURAL	51.39	47.16	19.85	10.27	19.38	18.05	16.46	15.39
Embu	59.34	53.17	22.87	12.60	1.65	1.77	1.61	1.60
Kitui	65.90	62.42	26.22	13.03	3.31	3.95	3.71	3.33
Machakos/Makueni	53.28	47.49	20.75	10.69	7.50	7.25	6.66	6.20
Meru/Tharaka	40.50	38.06	15.12	7.95	6.92	5.08	4.48	4.26
CENTRAL RURAL	44.98	39.34	16.51	7.97	16.66	13.58	11.77	10.26
Giambu	42.56	36.68	16.00	7.74	5.37	4.14	3.68	3.21
Kirinyaga	52.58	45.21	19.07	9.38	1.79	1.70	1.46	1.30
Murang'a	44.29	41.10	16.68	8.14	4.71	3.78	3.36	2.96
Nyandarua	46.07	34.44	14.56	6.31	1.66	1.39	1.04	0.81
Nyeri	45.23	39.98	16.73	8.16	3.13	2.56	2.24	1.97
RIFT/V RURAL	59.22	51.40	27.36	16.17	24.17	25.94	28.29	30.21
Kajiado/Narok	31.46	23.16	11.66	5.82	2.64	1.51	1.32	1.19
Kericho/Bomet	71.62	68.39	33.99	19.85	5.62	7.29	8.17	8.62
Laikipia	45.84	41.56	17.80	9.74	1.01	0.84	0.77	0.76
Nakuru	54.03	39.03	26.70	16.12	3.84	3.76	4.39	4.79
Nandi	68.62	59.44	28.96	15.07	2.54	3.16	3.15	2.96
Baringo	51.19	43.30	18.77	8.97	1.27	1.18	1.02	0.88
E. Marakwet	57.85	56.83	26.34	14.42	1.10	1.15	1.24	1.23
Trans Nzoia/U. Gishu	61.01	55.38	29.05	18.45	4.90	5.42	6.09	6.99
W. Pokot	72.25	66.11	40.28	29.08	1.24	1.63	2.14	2.79
NYANZA RURAL	57.43	54.10	24.82	13.97	19.09	19.87	20.27	20.61
Kisii	55.67	55.52	25.32	14.78	4.57	4.61	4.95	5.22
Kisumu	50.02	46.77	19.69	10.47	2.65	2.40	2.23	2.14
Siaya	49.98	46.28	20.03	10.56	4.24	3.84	3.63	3.46
Homa Bay/Migori	65.83	61.36	29.11	16.69	5.55	6.62	6.91	7.16
Nyamira	63.45	59.37	28.59	16.32	2.09	2.40	2.55	2.63
WESTERN RURAL	63.07	61.74	28.46	16.34	14.80	16.92	18.03	18.70
Bungoma	58.83	59.63	30.00	18.74	4.58	4.88	5.88	6.63
Busia	73.86	72.25	39.05	24.34	2.71	3.63	4.54	5.11
Kakamega/Vihiga	61.75	59.01	23.69	11.99	7.51	8.41	7.61	6.96
TOTAL RURAL	55.16	50.00	23.37	12.94	100.00	100.00	100.00	100.00

Source: Welfare Monitoring Survey, 1992 database.

Table 39: Decomposition of P α Poverty Measures by Region, 1992: Relative Hard Core Poverty Line

(1/3 of the mean: Shs 298.21)

	P α =0	P α =0	P α =1	P α =2	%of pop.	Contribution to national poverty (%)		
	adulteq	hholds	adulteq	adulteq		P α =0	P α =1	P α =2
COAST RURAL	18.16	14.88	5.62	2.62	5.91	4.65	4.31	4.13
Kilifi	22.26	15.79	6.82	2.88	2.21	2.13	1.95	1.70
Kwale/T. Taveta	17.81	15.86	4.94	2.38	2.58	1.99	1.65	1.64
Lamu/Tana River	10.92	9.82	4.81	2.64	1.12	0.53	0.70	0.79
EASTERN RURAL	16.65	14.52	5.45	2.68	19.38	13.97	13.72	13.85
Embu	19.00	16.51	8.01	4.20	1.65	1.35	1.71	1.85
Kini	18.68	18.05	5.94	2.83	3.31	2.68	2.55	2.50
Machakos/Makueni	18.47	15.26	5.45	2.55	7.50	6.00	5.31	5.10
Meru/Tharaka	13.17	11.60	4.61	2.38	6.92	3.95	4.15	4.40
CENTRAL RURAL	13.53	11.41	3.42	1.35	16.66	9.76	7.39	6.00
Kiambu	15.53	12.12	3.05	0.97	5.37	3.61	2.13	1.39
Kirinyaga	13.77	14.05	4.01	1.60	1.79	1.07	0.93	0.76
Murang'a	13.74	11.33	3.80	1.61	4.71	2.80	2.32	2.02
Nyandarua	9.35	5.95	2.25	0.97	1.66	0.67	0.49	0.43
Nyeri	11.90	11.63	3.74	1.66	3.13	1.61	1.52	1.39
RIFT/V RURAL	29.47	24.56	10.68	5.59	24.17	30.83	33.50	36.06
Kajiado/Narok	9.10	6.52	2.86	1.20	2.64	1.04	0.98	0.85
Kericho/Bomet	40.15	37.44	12.75	6.07	5.62	9.77	9.30	9.10
Laikipia	15.38	13.47	5.73	3.04	1.01	0.67	0.75	0.82
Nakuru	31.12	18.15	11.05	5.16	3.84	5.18	5.51	5.30
Nandi	28.07	22.81	7.43	3.12	2.54	3.09	2.45	2.11
Baringo	13.49	12.20	4.14	2.05	1.27	0.74	0.68	0.69
E. Marakwet	25.23	23.54	7.87	3.73	1.10	1.20	1.12	1.09
Trans Nzoia/U. Gishu	32.97	31.38	13.83	7.73	4.90	6.99	8.79	10.11
W. Pokot	39.99	39.19	24.29	18.06	1.24	2.15	3.91	5.99
NYANZA RURAL	26.61	23.13	8.66	3.93	19.09	21.99	21.45	20.02
Kisii	27.82	26.92	9.49	4.75	4.57	5.50	5.63	5.79
Kisumu	19.59	16.98	5.63	2.69	2.65	2.25	1.93	1.90
Siaya	20.84	17.11	5.83	2.25	4.24	3.82	3.21	2.54
Homa Bay/Migori	30.93	26.20	10.90	4.94	5.55	7.43	7.84	7.32
Nyamira	33.14	30.33	10.48	4.43	2.09	2.99	2.84	2.47
WESTERN RURAL	29.33	27.69	10.22	5.05	14.80	18.80	19.63	19.94
Bungoma	31.97	32.25	13.19	7.50	4.58	6.33	7.83	9.16
Busia	44.76	41.69	16.87	8.53	2.71	5.26	5.94	6.18
Kakamega/Vihiga	22.15	20.22	6.01	2.29	7.51	7.20	5.86	4.60
TOTAL RURAL	23.10	19.88	7.70	3.75	100.00	100.00	100.00	100.00

Source: Welfare Monitoring Survey, 1992 database.

Table 40: Mean monthly income by district, 1992

	Net Farm income Shs.	Non-farm income Shs.	Salaries/ wages Shs.	Other income Shs.	Total income Shs.	Farm income (%)	Non-farm income (%)	salaries/ wages (%)	other income (%)
COAST RURAL	578.74	751.19	956.54	232.47	2,518.95	22.98	29.82	37.97	9.23
Kilifi	225.77	509.44	1,006.01	229.44	1,970.66	11.46	25.85	51.05	11.64
Kwale/T. Taveta	500.91	991.43	854.68	251.39	2,598.40	19.28	38.16	32.89	9.67
Lamu/Tana River	1,636.50	602.60	1,143.68	183.32	3,566.10	45.89	16.90	32.07	5.14
EASTERN RURAL	1,220.54	655.75	520.97	257.09	2,654.35	45.98	24.70	19.63	9.69
Embu	29.45	172.71	522.83	368.60	1,093.58	2.69	15.79	47.81	33.71
Kimii	681.69	864.46	778.49	233.46	2,558.10	26.65	33.79	30.43	9.13
Machakos/Makueni	1,035.42	683.44	661.10	390.16	2,770.12	37.38	24.67	23.87	14.08
Meru/Tharaka	1,984.66	665.49	262.89	106.68	3,019.72	65.72	22.04	8.71	3.53
CENTRAL RURAL	897.44	554.36	757.99	237.60	2,447.39	36.67	22.65	30.97	9.71
Kiambu	711.35	695.54	1,345.83	160.50	2,913.21	24.42	23.88	46.20	5.51
Kirinyaga	1,620.38	211.33	427.33	261.99	2,521.03	64.27	8.38	16.95	10.39
Murang'a	464.66	424.28	423.47	269.13	1,581.54	29.38	26.83	26.78	17.02
Nyandarua	1,777.50	614.13	372.96	261.79	3,026.38	58.73	20.29	12.32	8.65
Nyeri	933.53	714.62	717.34	290.36	2,655.84	35.15	26.91	27.01	10.93
RIFT/V RURAL	1,139.39	468.05	734.34	205.84	2,547.63	44.72	18.37	28.82	8.08
Kajiado/Narok	2,113.79	717.97	968.26	480.26	4,280.27	49.38	16.77	22.62	11.22
Kericho/Bomet	1,034.45	328.13	607.60	210.04	2,180.22	47.45	15.05	27.87	9.63
Laikipia	727.57	331.45	903.34	138.93	2,101.28	34.62	15.77	42.99	6.61
Nakuru	846.58	551.40	758.58	179.36	2,335.92	36.24	23.61	32.47	7.68
Nandi	849.07	361.51	797.49	193.41	2,201.47	38.57	16.42	36.23	8.79
Baringo	736.37	334.38	1,391.99	86.33	2,549.07	28.89	13.12	54.61	3.39
E. Marakwet	761.33	525.28	593.01	168.06	2,047.68	37.18	25.65	28.96	8.21
Trans Nzoia/U. Gishu	1,508.35	590.87	523.64	133.63	2,756.49	54.72	21.44	19.00	4.85
W. Pokot	942.89	318.05	379.19	122.30	1,762.43	53.50	18.05	21.52	6.94
NYANZA RURAL	1,124.56	572.76	365.81	210.76	2,273.88	49.46	25.19	16.09	9.27
Kisii	809.09	558.55	522.63	322.67	2,212.95	36.56	25.24	23.62	14.58
Kisumu	690.49	341.79	429.70	191.05	1,653.04	41.77	20.68	25.99	11.56
Siaya	1,930.43	862.94	151.80	231.54	3,176.72	60.77	27.16	4.78	7.29
Homa Bay/Migori	713.32	563.54	363.30	107.49	1,747.65	40.82	32.25	20.79	6.15
Nyamira	1,643.64	252.15	502.56	285.40	2,683.74	61.24	9.40	18.73	10.63
WESTERN RURAL	663.94	627.40	534.39	268.87	2,094.61	31.70	29.95	25.51	12.84
Bungoma	755.91	1,640.40	783.41	366.97	3,546.68	21.31	46.25	22.09	10.35
Busia	602.93	155.90	234.25	132.68	1,125.77	53.56	13.85	20.81	11.79
Kakamega/Vihiga	638.14	270.23	513.59	267.21	1,689.15	37.78	16.00	30.40	15.82
TOTAL RURAL	1,008.31	577.89	608.95	232.28	2,427.44	41.54	23.81	25.09	9.57
Nairobi	-28.03	1,283.27	4,066.29	131.10	5,452.64	(0.51)	23.53	74.57	2.40
Mombasa	15.49	1,459.69	2,608.87	221.96	4,306.02	0.36	33.90	60.59	5.15
TOTAL URBAN	-19.60	1,317.44	3,784.01	148.70	5,230.55	(0.37)	25.19	72.34	2.84

Table 41: Sources of Income by Rural Poverty Group, 1992: Absolute Poverty Line

(Shs 484.98)

	All	Non-poor	Poor	All (%)	Non-poor (%)	Poor (%)
Farm enterprise	1,008.31	1,298.57	599.63	41.54	41.45	41.81
Non-farm	577.89	727.50	367.08	23.81	23.22	25.59
Salaries/wages	608.95	805.80	331.58	25.09	25.72	23.12
Other income	232.28	300.63	135.97	9.57	9.60	9.48
TOTAL	2,427.44	3,132.50	1,434.25	100.00	100.00	100.00

Table 42: Sources of Income by Rural Poverty Group, 1992: Absolute Hard Core Poverty Line

(Shs 404.66)

	All	Non-poor	Hard-Core Poor	All (%)	Non-poor (%)	Hard-Core Poor (%)
Farm enterprise	1,008.31	1,248.80	516.45	41.54	41.84	40.11
Non-farm	577.89	698.07	331.92	23.81	23.39	25.78
Salaries/wages	608.95	754.60	310.85	25.09	25.28	24.14
Other income	232.28	283.11	128.25	9.57	9.49	9.96
TOTAL	2,427.44	2,984.59	1,287.47	100.00	100.00	100.00

Source: Welfare Monitoring Survey, 1992 database.

Table 43: Comparison of Household Income and Expenditure, 1992

	Total Income (Shs)	Total Expenditure (Shs)	Income Expenditure ratio (%)	Difference (Shs)
COAST RURAL	2,518.95	3,077.31	81.86	(558.36)
Kilifi	1,970.66	3,109.89	63.37	(1,139.23)
Kwale	2,598.40	2,671.25	97.27	(72.85)
Lamu/Tana River	3,566.10	4,208.66	84.73	(642.56)
EASTERN RURAL	2,654.35	3,267.83	81.23	(613.47)
Embu	1,093.58	2,562.06	42.68	(1,468.48)
Kitui	2,558.10	2,669.26	95.84	(111.16)
Machakos/Makueni	2,770.12	3,069.56	90.24	(299.44)
Meru/Tharaka	3,019.72	3,937.79	76.69	(918.07)
CENTRAL RURAL	2,447.39	3,198.24	76.52	(750.86)
Kiambu	2,913.21	3,281.11	88.79	(367.91)
Kirinyaga	2,521.03	2,839.59	88.78	(318.56)
Murang'a	1,581.54	2,972.10	53.21	(1,390.56)
Nyandarua	3,026.38	3,166.62	95.57	(140.24)
Nyeri	2,655.84	3,676.05	72.25	(1,020.21)
RIFT VALLEY RURAL	2,547.63	3,135.06	81.26	(587.43)
Kajiado/Narok	4,280.27	4,370.14	97.94	(89.87)
Kericho/Bomet	2,180.22	2,421.90	90.02	(241.68)
Laikipia	2,101.28	2,958.67	71.02	(857.38)
Nakuru	2,335.92	3,072.79	76.02	(736.87)
Nandi	2,201.47	2,463.50	89.36	(262.02)
Baringo	2,549.07	3,387.61	75.25	(838.54)
E. Marakwet	2,047.68	2,841.06	72.07	(793.38)
Trans Nzoia/Uasin Gishu	2,756.49	4,193.81	65.73	(1,437.32)
W. Pokot	1,762.43	1,929.28	91.35	(166.86)
NYANZA RURAL	2,273.88	3,163.51	71.88	(889.62)
Kisii	2,212.95	3,340.95	66.24	(1,128.01)
Kisumu	1,653.04	2,957.23	55.90	(1,304.19)
Siaya	3,176.72	3,903.33	81.38	(726.62)
Homa Bay/Migori	1,747.65	2,185.18	79.98	(437.53)
Nyamira	2,683.74	4,278.58	62.73	(1,594.83)
WESTERN RURAL	2,094.61	2,713.59	77.19	(618.98)
Bungoma	3,546.68	3,371.28	105.20	175.40
Busia	1,125.77	1,969.16	57.17	(843.39)
Kakamega/Vihiga	1,689.15	2,641.07	63.96	(951.91)
TOTAL RURAL	2,427.44	3,115.09	77.93	(687.65)
Nairobi	5,452.64	6,082.70	89.64	(630.06)
Mombasa	4,306.02	4,286.47	100.46	19.55
TOTAL URBAN	5,230.55	5,734.80	91.21	(504.24)

Table 44: Household Size and Composition by Regions, Socio-economic Groups and Poverty Groups, 1992

	HH Size	Adult Eq.	Age cohorts (years)					Total
			0-4	5-14	15-24	25-49	50+	
Coast	5.51	4.23	15.37	33.08	16.81	25.48	9.26	100.00
Eastern	5.74	4.35	15.76	34.64	18.56	21.29	9.75	100.00
Central	4.62	3.65	13.01	31.46	20.49	23.33	11.70	100.00
Rift/V	5.60	4.25	15.47	35.09	18.53	22.88	8.03	100.00
Nyanza	4.84	3.76	13.59	34.01	19.27	21.34	11.79	100.00
Western	5.79	4.35	16.54	34.90	19.29	19.82	9.45	100.00
Total Rural	5.31	4.07	14.93	34.06	19.01	22.05	9.96	100.00
Nairobi	3.03	2.53	12.34	19.76	22.74	42.25	2.90	100.00
Mombasa	3.66	3.04	13.12	19.39	25.07	38.56	3.86	100.00
Total Urban	3.16	2.58	13.69	22.27	21.80	39.10	3.13	100.00
Rural Households								
Male-headed	5.78	4.43	15.24	31.38	18.55	26.26	8.57	100.00
Female-headed	4.31	3.31	13.43	35.71	21.36	19.02	10.49	100.00
Male-married	6.09	4.65	15.62	32.10	18.22	25.73	8.33	100.00
Male-other	2.80	2.36	8.59	19.03	24.38	35.28	12.73	100.00
Female-married	5.14	3.80	15.49	40.32	20.21	18.58	5.40	100.00
Female-other	3.57	2.88	11.08	30.45	22.68	19.52	16.27	100.00
Education:								
None	4.76	3.79	12.39	31.45	20.29	17.35	18.53	100.00
Primary	5.70	4.34	15.12	33.98	19.91	24.15	6.85	100.00
Secondary	5.40	3.94	17.97	30.35	16.92	32.83	1.93	100.00
Rural Poor	5.97	4.54	14.84	35.64	18.98	20.44	10.09	100.00
Rural Non-poor	4.84	3.74	14.76	30.23	19.57	27.16	8.27	100.00

Table 45: Decomposition of Rural P α Poverty Measures by Socio-economic Groups, Rural 1992: Absolute poverty Line

(Shs 484.98)

	P α =0	P α =0	P α =1	P α =2	% of pop.	Contribution to national poverty (%)		
	adulteq	hholds	adulteq	adulteq		P α =0	P α =1	P α =2
TOTAL	46.36	41.54	18.37	9.75	100.00	100.00	100.00	100.00
Male	45.64	40.44	18.24	9.73	74.06	72.91	73.54	73.86
Female	48.42	43.91	18.73	9.83	25.94	27.09	26.46	26.14
TOTAL	46.37	41.55	18.37	9.76	100.00	100.00	100.00	100.00
Male-married	45.73	41.29	18.30	9.78	70.28	69.30	70.01	70.49
Male-other	44.31	32.49	17.17	8.71	3.77	3.60	3.53	3.37
Female-married	44.61	40.79	16.14	8.19	14.06	13.52	12.35	11.80
Female-other	52.91	46.70	21.80	11.77	11.89	13.57	14.11	14.35
TOTAL	46.29	41.45	18.34	9.73	100.00	100.00	100.00	100.00
Cash crop	40.88	37.86	16.36	8.63	7.11	6.28	6.34	6.31
Subsistence farmer	52.32	47.42	21.29	11.44	61.56	69.58	71.46	72.36
Pastoralists	42.65	41.74	17.13	9.64	2.30	2.12	2.15	2.27
Public sector workers	21.24	18.26	6.56	2.90	9.70	4.45	3.47	2.89
Formal private sector	34.93	29.79	11.53	5.73	4.93	3.72	3.10	2.90
Informal sector	41.35	32.52	13.62	6.30	9.32	8.33	6.92	6.03
Landless/students/ inactive	50.29	42.33	23.63	13.82	5.09	5.53	6.56	7.23
TOTAL	46.29	41.45	18.34	9.73	100.00	100.00	100.00	100.00
None	57.42	51.67	23.74	13.14	16.20	20.10	20.97	21.88
Primary	45.49	39.27	17.59	9.07	50.14	49.28	48.09	46.72
Secondary	26.65	24.83	8.43	3.74	16.44	9.47	7.56	6.31
Others	56.89	52.62	24.90	14.18	17.22	21.16	23.38	25.09
TOTAL	46.29	41.45	18.34	9.73	100.00	100.00	100.00	100.00
1 Person	23.60	23.57	9.17	5.17	2.80	1.43	1.40	1.49
2-3	35.10	34.51	13.92	7.66	10.28	7.79	7.80	8.09
4-5	40.94	40.42	15.81	8.47	20.87	18.46	17.99	18.16
6-7	44.54	44.37	16.55	8.49	26.83	25.81	24.21	23.39
8-9	53.61	53.97	21.75	11.56	21.17	24.52	25.11	25.15
10+	56.36	56.31	23.87	12.79	18.05	21.98	23.49	23.73
TOTAL	46.29	41.45	18.34	9.73	100.00	100.00	100.00	100.00
0 Acres	31.08	22.38	11.84	6.10	7.08	4.75	4.57	4.43
0.01-0.99	49.63	44.26	20.67	11.54	6.66	7.14	7.51	7.90
1-1.99	53.69	47.88	21.23	11.57	15.72	18.24	18.20	18.69
2-2.99	46.05	41.88	18.72	10.26	17.24	17.15	17.59	18.18
3-3.99	45.10	41.58	17.53	8.99	12.18	11.87	11.64	11.24
4-4.99	50.75	45.94	21.79	11.87	9.10	9.98	10.81	11.10
5-6.99	44.61	42.69	16.97	8.75	11.48	11.06	10.63	10.32
7-9.99	49.15	45.84	17.65	8.59	7.12	7.56	6.85	6.28
10-19.99	47.62	43.39	19.09	9.86	8.33	8.57	8.67	8.44
20+	33.43	31.80	12.70	6.53	5.08	3.67	3.52	3.41
TOTAL	46.29	41.45	18.34	9.74	100.00	100.00	100.00	100.00
<= 25 Years	35.84	28.61	14.02	7.51	3.30	2.55	2.52	2.54
26-30	35.91	31.08	11.59	5.39	8.64	6.71	5.46	4.78
31-40	42.62	38.19	15.70	7.94	26.72	24.61	22.88	21.78
41-49	47.89	45.77	19.31	10.36	22.59	23.37	23.77	24.02
>50	51.09	47.06	21.48	11.78	38.75	42.77	45.37	46.87

Source: Welfare Monitoring Survey, 1992 database.

Table 46: Decomposition of Rural P α Poverty Measures by Socio-economic Groups, 1992: Absolute Hard Core Poverty Line

(Shs 404.66)

	P α =0	P α =0	P α =1	P α =2	%of pop.	Contribution to national poverty (%)		
	adulreq	hholds	adulreq	adulreq		P α =0	P α =1	P α =2
TOTAL	37.45	32.87	13.74	6.99	100.00	100.00	100.00	100.00
Male	37.00	32.17	13.68	6.99	74.06	73.18	73.76	74.07
Female	38.71	34.38	13.89	6.99	25.94	26.82	26.24	25.93
TOTAL	37.46	32.88	13.74	6.99	100.00	100.00	100.00	100.00
Male-married	37.01	32.74	13.76	7.05	70.28	69.44	70.36	70.83
Male-other	37.15	26.84	12.40	6.02	3.77	3.74	3.40	3.25
Female-married	34.53	30.33	11.62	5.70	14.06	12.96	11.88	11.45
Female-other	43.66	38.00	16.58	8.51	11.89	13.86	14.35	14.48
TOTAL	37.41	32.82	13.71	6.97	100.00	100.00	100.00	100.00
Cash crop	32.17	29.98	12.24	6.15	7.11	6.12	6.35	6.28
Subsistence farmer	42.91	37.84	16.11	8.26	61.56	70.61	72.29	72.89
Pastoralists	35.89	34.45	13.04	7.24	2.30	2.20	2.18	2.38
Public sector workers	15.39	12.89	4.22	1.82	9.70	3.99	2.99	2.53
Formal private sector	24.37	20.63	8.17	3.96	4.93	3.21	2.93	2.79
Informal sector	30.83	24.17	9.21	4.07	9.32	7.68	6.26	5.44
Landless/students /inactive	45.48	36.89	18.85	10.54	5.09	6.19	7.00	7.70
TOTAL	37.41	32.82	13.71	6.97	100.00	100.00	100.00	100.00
None	46.10	40.81	18.14	9.73	16.20	19.97	21.42	22.61
Primary	36.80	30.71	12.98	6.34	50.14	49.32	47.47	45.59
Secondary	19.45	17.87	5.58	2.31	16.44	8.55	6.69	5.45
Others	48.17	44.40	19.45	10.67	17.22	22.17	24.42	26.35
TOTAL	37.41	32.82	13.71	6.97	100.00	100.00	100.00	100.00
1 Person	17.80	17.78	6.97	3.91	2.80	1.33	1.42	1.57
2-3	27.75	27.11	10.42	5.68	10.28	7.62	7.81	8.37
4-5	31.82	31.32	11.73	6.16	20.87	17.75	17.85	18.43
6-7	34.71	34.37	12.07	5.94	26.83	24.89	23.62	22.83
8-9	44.34	44.49	16.36	8.27	21.17	25.09	25.25	25.12
10+	48.30	47.59	18.27	9.15	18.05	23.31	24.06	23.68
TOTAL	37.41	32.82	13.71	6.97	100.00	100.00	100.00	100.00
Landless	25.08	18.00	8.63	4.28	7.08	4.74	4.45	4.34
<1	40.16	35.75	15.85	8.59	6.66	7.15	7.70	8.21
1-1.99	41.90	37.30	16.09	8.47	15.72	17.61	18.45	19.10
2-2.99	37.61	33.06	14.15	7.55	17.24	17.33	17.78	18.66
3-3.99	37.26	33.76	12.97	6.24	12.18	12.13	11.52	10.89
4-4.99	42.55	37.51	16.90	8.60	9.10	10.35	11.22	11.23
5-6.99	35.14	32.17	12.32	6.17	11.48	10.78	10.32	10.15
7-9.99	39.46	35.93	12.52	5.75	7.12	7.51	6.50	5.87
10-19.99	39.82	35.18	14.25	6.86	8.33	8.87	8.66	8.19
20+	25.87	24.37	9.20	4.60	5.08	3.52	3.41	3.36
TOTAL	37.41	32.82	13.71	6.97	100.00	100.00	100.00	100.00
<=25 Years	29.22	21.82	10.30	5.47	3.30	2.58	2.48	2.59
26-30	25.48	22.27	7.80	3.51	8.64	5.89	4.92	4.35
31-40	33.72	29.62	11.35	5.48	26.72	24.09	22.12	21.01
41-49	39.33	36.77	14.56	7.47	22.59	23.75	23.99	24.20
>50	42.20	38.35	16.46	8.61	38.75	43.70	46.50	47.85

Source: Welfare Monitoring Survey, 1992 database.

Table 47: Gender/Marital Status per Adult Equivalent Expenditure Percentiles Relative to Aggregate Household Deciles, 1982-92 (%)

RURAL 1982 FOR EXPENDITURE WITHOUT RENT										
Adult Equivalent Expenditure	59.36	75.97	91.60	106.56	126.07	147.62	177.87	222.07	300.13	5,129.36
TOTAL (HHs)	10.00	20.00	30.00	40.00	50.00	60.00	70.00	80.00	90.00	100.00
TOTAL (adulteq.)	12.92	25.06	37.18	48.59	58.97	69.08	78.74	87.16	94.46	100.00
MALE	13.76	26.11	38.35	49.85	60.70	70.87	80.07	87.92	94.77	100.00
MALE-MARRIED	13.75	26.40	38.91	50.45	61.32	71.43	80.62	88.43	95.11	100.00
MALE-OTHER	13.87	19.51	25.61	36.35	46.68	58.16	67.72	76.31	87.14	100.00
FEMALE	10.40	21.90	33.65	44.78	53.76	63.68	74.72	84.87	93.52	100.00
FEMALE-MARRIED	9.17	20.88	32.10	42.59	51.21	60.92	73.38	84.37	93.04	100.00
FEMALE-OTHER	12.12	23.31	35.81	47.82	57.30	67.51	76.59	85.57	94.18	100.00
RURAL 1992 FOR EXPENDITURE WITHOUT RENT										
Adult Equivalent Expenditure	206.36	300.03	378.84	471.14	573.37	693.15	867.01	1,158.14	1,757.92	29,086.59
TOTAL (HHs)	10.00	20.00	30.00	40.00	50.00	60.00	70.00	80.00	90.00	100.00
TOTAL (adulteq.)	11.37	23.21	34.34	44.84	55.27	65.68	75.44	84.89	93.28	100.00
MALE	11.58	22.95	33.99	44.25	54.43	64.75	74.59	84.32	93.00	100.00
MALE-MARRIED	11.70	23.15	34.01	44.29	54.62	64.86	74.89	84.73	93.28	100.00
MALE-OTHER	9.25	19.35	33.59	43.53	50.75	62.81	69.17	76.67	87.69	100.00
FEMALE	10.79	23.95	35.34	46.50	57.69	68.32	77.87	86.51	94.07	100.00
FEMALE-MARRIED	8.73	19.80	30.71	42.49	53.44	65.71	75.96	85.94	93.65	100.00
FEMALE-OTHER	13.22	28.86	40.82	51.23	62.72	71.39	80.13	87.18	94.56	100.00
URBAN 1992 FOR EXPENDITURE WITH RENT										
Adult Equivalent Expenditure	769.90	989.90	1,204.25	1,437.60	1,751.27	2,059.61	2,610.00	3,287.00	5,324.29	32,116.67
TOTAL (HHs)	10.00	20.00	30.00	40.00	50.00	60.00	70.00	80.00	90.00	100.00
TOTAL (adulteq.)	16.22	29.48	39.85	49.65	58.93	67.45	77.03	85.45	92.86	100.00
MALE	15.17	29.22	40.27	50.60	59.55	67.65	76.83	85.45	92.61	100.00
MALE-MARRIED	16.46	30.19	41.97	53.10	61.55	69.88	79.28	86.97	93.40	100.00
MALE-OTHER	6.80	22.89	29.16	34.27	46.48	53.15	60.85	75.54	87.43	100.00
FEMALE	21.50	30.80	37.74	44.89	55.80	66.45	78.07	85.45	94.12	100.00
FEMALE-MARRIED	19.51	29.05	34.78	47.47	58.29	70.54	90.30	90.30	99.15	100.00
FEMALE-OTHER	22.18	31.39	38.75	44.01	54.96	65.05	73.90	83.80	92.40	100.00
URBAN 1992 FOR EXPENDITURE WITHOUT RENT										
Adult Equivalent Expenditure	652.17	813.33	1,016.56	1,217.61	1,487.67	1,798.76	2,274.58	2,836.70	4,646.42	32,116.67
TOTAL (HHs)	10.00	20.00	30.00	40.00	50.00	60.00	70.00	80.00	90.00	100.00
TOTAL (adulteq.)	15.29	27.65	38.42	49.19	58.18	67.56	76.74	85.25	93.08	100.00
MALE	15.03	27.40	38.99	50.19	59.51	67.67	76.85	85.14	92.80	100.00
MALE-MARRIED	15.47	28.04	40.38	52.27	61.51	69.88	79.18	86.49	93.36	100.00
MALE-OTHER	12.15	23.20	29.91	36.63	46.43	53.25	61.65	76.28	89.17	100.00
FEMALE	16.63	28.95	35.52	44.16	51.52	67.03	76.20	85.80	94.48	100.00
FEMALE-MARRIED	17.01	29.05	32.36	43.00	49.99	73.07	83.09	91.13	99.15	100.00
FEMALE-OTHER	16.51	28.92	36.59	44.55	52.04	64.98	73.85	83.99	92.89	100.00

Source: Rural Household Budget Survey, 1981/82 and Welfare Monitoring Survey, 1992 databases.

Table 48: Rural Household Food Expenditure Patterns by Poverty Group, 1992: Absolute Poverty line

(Shs 484.98)

	<u>All</u>	<u>Non-poor</u>		<u>Poor</u>		
	(%)	(%)	%	(%)	(%)	(%)
Maize		100.00		74.63		25.37
	24.65		23.76		27.71	
Cereals		100.00		81.12		18.88
	8.03		8.42		6.72	
Vegetables		100.00		75.94		24.06
	5.87		5.75		6.26	
Meats		100.00		78.21		21.79
	9.45		9.55		9.13	
Dairy products		100.00		83.81		16.19
	7.59		8.21		5.44	
Sugar		100.00		70.95		29.05
	10.60		9.71		13.65	
Oils and fats		100.00		72.42		27.58
	5.21		4.87		6.37	
Roots		100.00		72.42		27.58
	1.84		1.97		1.42	
Own consumption		100.00		82.57		17.43
	24.95		25.70		22.38	
Other food		100.00		79.76		20.24
	1.80		2.05		0.93	
Total food		100.00		77.43		22.57
	100.00		100.00		100.00	

Table 49: Rural Household Non-Food Expenditure Patterns by Poverty Group, 1992: Absolute Poverty Line

(Shs 484.98)

	<u>All</u> (%)	<u>Non-poor</u> (%)	<u>Non-poor</u> %	(%)	<u>Poor</u> (%)	(%)
Clothing	24.49	100.00	24.12	85.15	26.83	14.85
Utilities	0.79	100.00	0.83	90.51	0.55	9.49
Insurance	0.44	100.00	0.49	96.50	0.11	3.50
Non-durables	6.88	100.00	5.93	74.51	12.93	25.49
Domestic wages	9.03	100.00	10.06	96.35	2.43	3.65
Rent	2.62	100.00	2.48	81.76	3.52	18.24
Transfers	0.70	100.00	0.70	86.25	0.71	13.75
Beverages	5.55	100.00	5.28	82.26	7.26	17.74
Cooking fuel	2.62	100.00	2.47	81.55	3.56	18.45
Transport	9.82	100.00	9.75	85.84	10.26	14.16
Recreation	8.79	100.00	9.81	96.47	2.29	3.53
Health	2.31	100.00	2.18	81.75	3.10	18.25
Education	14.73	100.00	13.98	82.02	19.54	17.98
Harambee	0.57	100.00	0.57	85.30	0.62	14.70
Durables	2.09	100.00	2.28	94.32	0.88	5.68
Other expenditure	8.58	100.00	9.08	91.48	5.39	8.52
Total non-food	100.00	100.00	100.00	86.44	100.00	13.56

Memorandum items

	<u>all</u> (%)	<u>Non-poor</u> (%)	<u>Non-poor</u> %	(%)	<u>Poor</u> (%)	(%)
Food	48.65	100.00	45.91	77.43	61.20	22.57
Non-food	51.35	100.00	54.09	86.44	38.80	13.56
Total	100.00	100.00	100.00	82.06	100.00	17.94

Table 50: Rural Household Food Expenditure Patterns by Poverty Group, 1992: Absolute Hard core Poverty line

(Shs 404.66)

	<u>All</u>	<u>"Others"</u>		<u>Hard core Poor</u>	
	(%)	(%)	%	(%)	(%)
Maize		100.00		82.24	17.76
	24.65		24.17		27.14
Cereals		100.00		87.31	12.69
	8.03		8.36		6.32
Vegetables		100.00		82.92	17.08
	5.87		5.80		6.21
Meats		100.00		84.31	15.69
	9.45		9.50		9.19
Dairy products		100.00		88.19	11.81
	7.59		7.98		5.56
Sugar		100.00		78.58	21.42
	10.60		9.93		14.08
Oils and fats		100.00		79.55	20.45
	5.21		4.94		6.60
Roots		100.00		79.55	20.45
	1.84		1.96		1.26
Own consumption		100.00		88.96	11.04
	24.95		25.35		22.88
Other food		100.00		85.21	14.79
	1.80		2.00		0.75
Total food		100.00		83.87	16.13
	100.00		100.00		100.00

Table 51: Rural Household Non-Food Expenditure Patterns by Poverty Group, 1992: Absolute Hard Core Poverty Line

(Shs 404.66)

	<u>All</u>		<u>"Others"</u>		<u>Hard core Poor</u>	
	(%)	(%)	%	(%)	(%)	(%)
Clothing		100.00		89.92		10.08
	24.49		24.32		26.05	
Utilities		100.00		94.47		5.53
	0.79		0.83		0.46	
Insurance		100.00		98.63		1.37
	0.44		0.47		0.06	
Non-durables		100.00		81.00		19.00
	6.88		6.15		13.79	
Domestic wages		100.00		97.84		2.16
	9.03		9.76		2.06	
Rents		100.00		86.62		13.38
	2.62		2.51		3.70	
Transfers		100.00		90.56		9.44
	0.70		0.70		0.70	
Beverages		100.00		87.86		12.14
	5.55		5.39		7.11	
Cooking fuel		100.00		86.45		13.55
	2.62		2.50		3.74	
Transport		100.00		90.40		9.60
	9.82		9.81		9.94	
Recreation		100.00		97.94		2.06
	8.79		9.51		1.91	
Health		100.00		87.10		12.90
	2.31		2.22		3.14	
Education		100.00		86.89		13.11
	14.73		14.14		20.37	
Harambee		100.00		89.76		10.24
	0.57		0.57		0.62	
Durables		100.00		96.15		3.85
	2.09		2.22		0.85	
Other expenditure		100.00		93.95		6.05
	8.58		8.90		5.48	
Total non-food		100.00		90.52		9.48
	100.00		100.00		100.00	
Memorandum items						
	<u>All</u>		<u>"Others"</u>		<u>Poor</u>	
	(%)	(%)	%	(%)	(%)	(%)
Food		100.00		83.87		16.13
	48.65		46.75		61.72	
Non-food		100.00		90.52		9.48
	51.35		53.25		38.28	
Total		100.00		87.29		12.71
	100.00		100.00		100.00	

Table 52: Urban Household Food Expenditure Patterns by Poverty Group, 1992: Absolute Poverty Line

(Shs 1009.70)

	<u>All</u> (%)	(%)	<u>Non-poor</u> %	(%)	<u>Poor</u> (%)	(%)
Maize		100.00		80.73		19.27
	17.79		16.95		22.41	
Cereals		100.00		85.83		14.17
	12.35		12.52		11.45	
Vegetables		100.00		85.39		14.61
	12.16		12.26		11.62	
Meats		100.00		86.74		13.26
	16.77		17.18		14.55	
Dairy products		100.00		85.94		14.06
	15.19		15.41		13.96	
Sugar		100.00		81.01		18.99
	8.09		7.74		10.05	
Oils and fats		100.00		80.86		19.14
	6.41		6.12		8.02	
Roots		100.00		80.86		19.14
	3.20		3.19		3.21	
Own consumption		100.00		84.66		15.34
	0.08		0.01		0.52	
Other food		100.00		6.47		93.53
	7.96		8.63		4.22	
Total food		100.00		84.71		15.29
	100.00		100.00		100.00	

Table 53: Urban Household Non-Food Expenditure Patterns by Poverty Group, 1992: Absolute Poverty Line

(Shs 1009.70)

	<u>All</u> (%)	<u>Non-poor</u> (%)	<u>Poor</u> (%)	<u>All</u> (%)	<u>Non-poor</u> (%)	<u>Poor</u> (%)
Clothing	16.92	100.00	94.19	17.09	14.54	5.81
Utilities	3.38	100.00	92.45	3.35	3.77	7.55
Insurance	0.71	100.00	98.82	0.76	0.12	1.18
Non-durables	3.89	100.00	87.79	3.67	7.03	12.21
Domestic wages	6.27	100.00	96.46	6.49	3.29	3.54
Rent	19.20	100.00	90.98	18.74	25.62	9.02
Transfers	0.92	100.00	94.14	0.93	0.79	5.86
Beverages	6.72	100.00	94.00	6.77	5.96	6.00
Cooking fuel	3.21	100.00	83.63	2.88	7.77	16.37
Transport	9.61	100.00	92.07	9.49	11.28	7.93
Recreation	11.30	100.00	98.37	11.92	2.73	1.63
Health	1.19	100.00	87.98	1.12	2.12	12.02
Education	6.68	100.00	90.14	6.46	9.75	9.86
Harambee	0.30	100.00	97.00	0.31	0.13	3.00
Durables	5.02	100.00	97.30	5.24	2.00	2.70
Other expenditure	4.68	100.00	95.52	4.80	3.10	4.48
Total non-food	100.00	100.00	93.24	100.00	100.00	6.76
Memorandum items						
	<u>All</u> (%)	<u>Non-poor</u> (%)	<u>Poor</u> (%)	<u>All</u> (%)	<u>Non-poor</u> (%)	<u>Poor</u> (%)
Food	31.39	100.00	84.71	29.36	50.86	15.29
Non-food	68.61	100.00	93.24	70.64	49.14	6.76
Total	100.00	100.00	90.56	100.00	100.00	9.44

Table 54: Urban Household Food Expenditure Patterns by Poverty Group, 1992: Absolute Hard Core Poverty Line

(Shs 514.25)

	<u>All</u> (%)	(%)	<u>"Others"</u> %	(%)	<u>Hard core</u> <u>Poor</u> (%)	(%)
Maize	17.79	100.00	17.64	97.41	26.03	2.59
Cereals	12.35	100.00	12.38	98.43	10.94	1.57
Vegetables	12.16	100.00	12.12	97.88	14.58	2.12
Meats	16.77	100.00	16.87	98.80	11.41	1.20
Dairy products	15.19	100.00	15.28	98.86	9.78	1.14
Sugar	8.09	100.00	8.03	97.51	11.40	2.49
Oils and fats	6.41	100.00	6.35	97.37	9.53	2.63
Roots	3.20	100.00	3.21	97.37	2.17	2.63
Own consumption	0.08	100.00	0.07	98.80	0.66	1.20
Other food	7.96	100.00	8.04	86.14	3.49	13.86
Total food	100.00	100.00	100.00	98.23	100.00	1.77

Table 55: Urban Household Non-Food Expenditure Patterns by Poverty Group, 1992: Absolute Hard Core Poverty Line

(Shs 514.25)

	<u>All</u> (%)	(%)	<u>"Others"</u> %	(%)	<u>Hard core</u> <u>Poor</u> (%)	(%)
Clothing		100.00		99.71		0.29
	16.92		16.99		6.96	
Utilities		100.00		98.68		1.32
	3.38		3.35		6.25	
Insurance		100.00		100.00		0.00
	0.71		0.72		0.00	
Non-durables		100.00		97.84		2.16
	3.89		3.84		11.79	
Domestic wages		100.00		99.87		0.13
	6.27		6.31		1.13	
Rent		100.00		99.03		0.97
	19.20		19.15		26.17	
Transfers		100.00		99.48		0.52
	0.92		0.92		0.67	
Beverages		100.00		99.59		0.41
	6.72		6.74		3.88	
Cooking fuel		100.00		97.67		2.33
	3.21		3.15		10.44	
Transport		100.00		99.35		0.65
	9.61		9.62		8.76	
Recreation		100.00		99.92		0.08
	11.30		11.37		1.29	
Health		100.00		98.61		1.39
	1.19		1.18		2.33	
Education		100.00		98.52		1.48
	6.68		6.63		13.81	
Harambee		100.00		99.71		0.29
	0.30		0.30		0.12	
Durables		100.00		99.53		0.47
	5.02		5.03		3.32	
Other expenditure		100.00		99.53		0.47
	4.68		4.69		3.08	
Total non-food		100.00		99.29		0.71
	100.00		100.00		100.00	
Memorandum items						
	<u>All</u> (%)	(%)	<u>"Others"</u> %	(%)	<u>Poor</u> (%)	(%)
Food		100.00		98.23		1.77
	31.39		31.16		53.10	
Non-food		100.00		99.29		0.71
	68.61		68.84		46.90	
Total		100.00		98.95		1.05
	100.00		100.00		100.00	

Table 56: Distribution of Rural Households by Holding Size, Province and Gender/Marital Status, 1992 (%)

Holding Size (Acre)	Share(%)										Total	Share(%)	Mean holding size (excluding >50)	Mean holding size
	0	<1	1-1.99	2.2-99	3-3.99	4-4.99	5-6.99	7-9.99	10-19.99	>20				
Total	10.12	8.14	17.02	17.83	12.35	8.77	10.08	5.43	6.43	3.83	100.00	100.00	4.00	4.61
Coast	25.25	1.69	8.10	11.99	11.67	9.97	14.81	6.02	9.24	1.25	100.00	100.00	3.83	3.89
Eastern	1.62	3.98	18.28	18.54	13.30	9.73	10.98	7.98	9.88	6.32	100.00	100.00	5.41	5.77
Central	17.93	19.52	21.97	14.95	8.64	4.34	5.98	3.44	2.26	0.97	100.00	100.00	2.24	2.28
Rift Valley	17.54	6.87	13.24	12.71	10.30	7.89	9.48	6.34	7.84	7.79	100.00	100.00	4.71	6.73
Nyanza	2.95	4.17	14.93	27.10	18.20	12.23	10.16	4.92	3.93	1.40	100.00	100.00	3.53	3.64
Western	2.82	9.00	21.85	17.91	11.10	9.25	13.34	4.55	7.70	2.48	100.00	100.00	4.10	4.40
Male	10.96	7.10	14.82	16.91	12.59	8.97	10.74	6.37	7.30	4.25	100.00	100.00	4.28	4.95
Male-married	9.45	6.80	14.76	17.02	12.81	9.31	11.13	6.65	7.47	4.60	100.00	100.00	4.45	5.19
Male-other	25.20	9.97	15.36	15.82	10.45	5.84	7.09	3.72	5.65	0.89	100.00	100.00	2.69	2.73
Female	8.05	10.37	21.65	19.89	11.88	8.48	8.85	3.47	4.60	2.77	100.00	100.00	3.40	3.71
Female-married	4.75	8.91	20.56	21.28	13.09	9.43	9.99	3.51	5.37	3.11	100.00	100.00	3.62	4.17
Female-other	10.99	11.67	22.62	18.64	10.80	7.63	7.83	3.44	3.91	2.46	100.00	100.00	3.20	3.30

Note: 57 out of 6,325 responding households had over 50 acres.

The mean holding size includes households with "no holding", i.e. landless.

Table 57: Ownership of Selected Assets by Region, Rural 1992.

	<<< Per thousand households >>						
	Holding size	Cattle owned	Sheep/goats	Poultry	Motor cycles	Bicycles	Cars
Coast	3.83	4.34	4.82	9.64	5.49	178.90	15.17
Eastern	5.41	2.47	3.64	5.25	3.89	192.38	13.68
Central	2.24	1.55	1.46	6.43	3.50	142.89	23.99
Rift Valley	4.71	6.80	7.99	7.75	4.66	177.27	18.39
Nyanza	3.53	2.68	1.72	9.44	1.76	221.13	4.97
Western	4.10	2.37	1.56	8.33	0.00	342.64	12.54
Overall Rural	4.00	3.44	3.63	7.59	3.11	205.67	14.81

Note: (a) The mean holding size excludes households with over 50 acres, but includes households with "no holding", i.e. landless.

(b) In the case of motor cycles, bicycles and cars, the results show the proportion of households reporting as owning at least one unit of the asset during the survey period.

Table 58: Proportion of Households/Holders by Size of Holding, 1986/87 (%)

District	Holding size in Acres								
	No Holding	Up to 2	2.1-4	4.1-6	6.1-8	8.1-10	10.1-15	15.1-20	Over 20
Kilifi	0	36	22	12	10	4	14	1	1
Kwale	0	30	26	15	12	4	5	3	5
Taita-Taveta	0	52	16	10	5	3	6	4	4
Machakos	0	30	15	15	6	10	8	5	11
Kitui	6	17	20	13	7	7	15	3	12
Mturu	2	47	32	9	4	3	2	1	0
Embu	1	42	25	12	6	9	4	0	1
Nyeri	1	62	18	11	5	0	1	0	2
Murang'a	0	65	21	5	3	2	3	0	1
Kirinyaga	0	51	24	15	8	2	0	0	0
Kiambu	8	68	16	4	2	2	0	0	0
Nyandarua	2	27	21	10	9	3	7	5	16
Nakuru	22	26	23	10	4	7	3	4	2
Nandi	6	25	16	10	9	8	12	6	8
Kericho	0	25	22	10	6	7	14	7	9
Uasin-Gishu	3	28	11	10	5	10	11	10	12
Trans-Nzoia	7	45	19	12	5	5	2	1	4
S.Nyanza	2	47	14	8	4	5	4	6	10
Kisii	1	58	25	9	1	2	1	3	0
Kisumu	0	59	22	9	5	4	1	0	0
Siaya	0	42	28	14	6	3	3	0	4
Kakamega	0	59	23	5	5	3	2	2	1
Bungoma	2	27	32	14	6	5	9	2	3
Busia	0	23	29	20	9	5	6	6	2
Mean (%)	5	40	21	10	5	5	5	4	5

Note: The row totals do not add up to 100 for some of districts and even for the overall mean holdings.

According to *Economic Survey 1989*, the landless in Nakuru district are "mainly workers in large scale farms and estates but including farming members of land buying companies whose farms had not been subdivided at the time of the survey".

Source: Central Bureau of Statistics, Agricultural Production Survey 1986/87 (APS), *Economic Survey 1989*

Table 59: Decomposition of P_α National Poverty Measures by Region, 1992: Respective Absolute Poverty Lines

(Shs 484.98 for Rural Areas and Shs 1,009.70 for Urban Areas)

	P _α =0	P _α =0	P _α =1	P _α =2	% of pop.	Contribution to national poverty (%)		
	adulteq	hholds	adulteq	adulteq		P _α =0	P _α =1	P _α =2
COAST RURAL	43.50	37.90	15.38	7.63	5.37	5.22	4.72	4.44
Kilifi	48.05	36.94	17.44	8.75	2.01	2.15	2.00	1.90
Kwale/T. Taveta	49.56	45.15	16.29	7.62	2.34	2.59	2.18	1.94
Lamu/Tana River	20.62	18.57	9.25	5.46	1.02	0.47	0.54	0.60
EASTERN RURAL	42.16	38.08	14.93	7.42	17.61	16.58	15.02	14.16
Embu	44.52	39.73	17.50	9.59	1.50	1.49	1.49	1.56
Kitui	58.21	55.13	19.55	9.04	3.01	3.91	3.36	2.95
Machakos/Makueni	43.32	36.78	15.70	7.67	6.82	6.59	6.11	5.67
Meru/Tharaka	32.68	30.94	11.28	5.84	6.29	4.59	4.05	3.99
CENTRAL RURAL	35.89	31.21	12.09	5.43	15.14	12.13	10.45	8.91
Kiambu	32.68	28.33	11.87	5.27	4.88	3.56	3.31	2.79
Kirinyaga	41.85	35.77	14.20	6.47	1.63	1.52	1.32	1.14
Murang'a	37.30	33.83	12.17	5.61	4.28	3.56	2.97	2.60
Nyandarua	36.67	25.17	9.82	3.93	1.51	1.24	0.85	0.64
Nyeri	35.44	32.36	12.34	5.62	2.84	2.25	2.00	1.73
RIFT/V RURAL	51.51	44.54	22.29	12.69	21.96	25.27	27.97	30.23
Kajiado/Narok	25.11	17.88	8.63	4.10	2.40	1.35	1.18	1.07
Kericho/Bomet	64.70	61.39	27.87	15.39	5.11	7.38	8.13	8.52
Laikipia	34.37	30.44	13.71	7.35	0.92	0.70	0.72	0.73
Nakuru	47.70	33.66	22.22	12.76	3.49	3.72	4.43	4.83
Nandi	59.05	48.49	22.60	10.76	2.31	3.04	2.98	2.70
Baringo	46.43	38.18	13.27	6.11	1.16	1.20	0.88	0.77
E. Marakwet	52.89	50.55	20.97	10.68	1.00	1.18	1.20	1.16
Trans Nzoia/U. Gishu	50.80	48.39	24.26	15.18	4.45	5.05	6.17	7.33
W. Pokot	65.22	61.49	35.36	25.56	1.13	1.64	2.28	3.13
NYANZA RURAL	47.41	43.37	19.73	10.64	17.34	18.37	19.55	20.02
Kisii	46.09	45.81	20.52	11.52	4.15	4.27	4.87	5.19
Kisumu	39.06	34.94	15.12	7.71	2.41	2.10	2.08	2.01
Siaya	40.19	34.18	15.39	7.70	3.85	3.46	3.38	3.21
Homa Bay/Migori	55.67	50.81	23.37	12.86	5.04	6.27	6.73	7.03
Nyamira	53.65	51.07	23.01	12.53	1.90	2.27	2.49	2.58
WESTERN RURAL	54.81	53.45	22.97	12.57	13.45	16.47	17.65	18.34
Bungoma	54.81	56.11	25.16	15.16	4.16	5.09	5.98	6.84
Busia	67.66	65.76	33.26	19.58	2.47	3.73	4.69	5.24
Kakamega/Vihiga	50.17	47.59	17.91	8.46	6.83	7.65	6.98	6.26
TOTAL RURAL	46.33	41.51	18.37	9.75	90.88	94.03	95.35	96.10
TOTAL URBAN	29.29	20.64	8.92	3.94	9.12	5.97	4.65	3.90
Nairobi	26.45	19.39	7.68	3.42	7.08	4.18	3.10	2.63
Mombasa	39.17	25.84	13.25	5.76	2.04	1.78	1.54	1.28
NATION	44.78	38.70	17.51	9.22	100.00	100.00	100.00	100.00

Source: Welfare Monitoring Survey, 1992 database.

Table 60: Household Main Sources of Water (Now) in Wet Season by Province, 1992 (%)

	Coast Rural	Eastern Rural	Central Rural	Rift Valley Rural	Nyanza Rural	Western Rural	Nairobi Urban	Mombasa Urban	Other Urban	Total	Total Rural	Total Urban
Others	1.22	2.14	1.47	1.22	3.77	0.38	7.14	0.00	1.38	2.29	1.84	4.01
River	21.38	32.50	26.43	37.72	31.82	11.79	1.61	0.99	5.37	23.59	28.93	3.04
Lake/pond/dam	18.90	6.60	1.64	4.73	15.76	1.13	0.22	0.00	0.41	5.67	7.07	0.27
Roof catchment	4.13	16.29	24.48	11.71	8.12	3.17	0.04	0.00	1.13	10.08	12.57	0.47
Protected spring	0.31	3.25	1.24	3.57	8.50	14.01	0.00	0.00	0.34	4.27	5.35	0.14
Unprotected spring	4.20	9.42	4.04	12.50	16.48	24.59	0.00	0.00	0.45	9.86	12.38	0.18
Protected well	8.44	1.88	2.48	7.00	5.55	7.03	0.00	0.26	3.27	4.26	5.02	1.34
Unprotected well	4.49	5.91	2.77	4.57	3.14	8.02	0.00	0.00	0.87	3.76	4.65	0.35
Borehole	10.43	0.67	5.46	2.66	3.85	19.03	0.04	0.32	5.15	5.02	5.77	2.12
Piped water	26.51	21.34	30.00	14.34	2.99	10.86	90.95	98.43	81.63	31.20	16.41	88.10
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Table 61: Household Main Sources of Water (Now) in Dry Season by Province, 1992 (%)

	Coast Rural	Eastern Rural	Central Rural	Rift Valley Rural	Nyanza Rural	Western Rural	Nairobi Urban	Mombasa Urban	Other Urban	Total	Total Rural	Total Urban
Others	0.15	2.24	0.27	0.87	2.45	0.16	1.34	0.00	1.65	1.22	1.19	1.31
River	20.18	41.03	42.28	44.43	37.07	11.79	1.53	0.89	6.63	29.29	36.00	3.49
Lake/pond/dam	9.61	3.75	3.35	6.21	15.27	0.93	0.00	0.00	0.88	5.28	6.56	0.35
Roof catchment	0.34	3.12	2.39	0.60	0.77	0.00	0.00	0.00	0.00	1.05	1.33	0.00
Protected spring	0.31	4.57	1.58	3.96	10.20	15.56	0.00	0.00	0.34	5.03	6.31	0.14
Unprotected spring	5.22	9.07	3.80	12.77	16.32	26.46	0.00	0.00	1.09	10.10	12.62	0.44
Protected well	9.59	2.78	2.72	6.52	5.56	7.28	0.00	0.26	3.47	4.43	5.21	1.42
Unprotected well	5.95	6.89	5.76	4.71	2.84	7.52	0.00	0.00	0.87	4.34	5.38	0.35
Borehole	13.44	2.30	7.47	4.49	6.05	19.87	0.08	1.48	6.01	6.58	7.61	2.61
Piped water	35.22	24.26	30.37	15.45	3.45	10.42	97.05	97.37	79.05	32.67	17.79	89.89
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Table 62: Household Distance to Water in Wet Season (Now) by Province, 1992 (%)

	Coast Rural	Eastern Rural	Central Rural	Rift Valley Rural	Nyanza Rural	Western Rural	Nairobi Urban	Mombasa Urban	Other Urban	Total	Total Rural	Total Urban
Less than 1 km	72.06	76.42	91.63	80.87	81.03	83.72	99.66	99.32	96.48	85.27	81.95	98.31
1-2 km	21.44	17.17	5.60	15.84	16.16	13.53	0.24	0.68	3.52	11.71	14.28	1.64
3-4 km	4.45	4.49	2.55	1.76	1.34	0.69	0.00	0.00	0.00	1.85	2.32	0.00
5-8 km	1.23	0.84	0.10	0.52	0.56	0.46	0.10	0.00	0.00	0.44	0.54	0.05
9-12 km	0.25	0.80	0.11	0.59	0.71	1.17	0.00	0.00	0.00	0.50	0.63	0.00
Over 12 km	0.58	0.29	0.00	0.42	0.20	0.43	0.00	0.00	0.00	0.23	0.28	0.00
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Table 63: Household Main Sources of Fuel by Province, 1992 (%)

	Coast Rural	Eastern Rural	Central Rural	Rift Valley Rural	Nyanza Rural	Western Rural	Nairobi Urban	Mombasa Urban	Other Urban	Total	Total Rural	Total Urban
Firewood collected	80.94	88.27	64.36	83.00	88.24	86.23	0.43	4.83	5.56	65.63	81.87	3.00
Firewood purchased	8.43	5.82	22.73	8.92	7.57	7.76	1.23	2.98	2.97	8.76	10.48	2.13
Charcoal	6.33	2.33	4.28	3.29	2.29	1.65	3.15	16.04	31.46	5.70	3.04	15.97
Paraffin	4.23	2.77	6.40	4.50	1.58	3.73	78.73	70.03	53.18	16.93	3.82	67.50
Gas	0.00	0.03	0.46	0.24	0.32	0.49	11.76	4.88	3.91	1.83	0.28	7.82
Electricity (mains)	0.07	0.78	0.05	0.00	0.00	0.00	4.63	1.16	2.73	0.84	0.15	3.47
Electricity (generator)	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.00
Other	0.00	0.00	1.63	0.06	0.00	0.13	0.06	0.09	0.17	0.29	0.34	0.11
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Table 64: Household Main Sources of Lighting by Province, 1992 (%)

	Coast Rural	Eastern Rural	Central Rural	Rift Valley Rural	Nyanza Rural	Western Rural	Nairobi Urban	Mombasa Urban	Other Urban	Total	Total Rural	Total Urban
Firewood collected	3.10	7.32	1.77	8.15	2.33	2.23	0.57	1.65	0.34	3.70	4.50	0.60
Firewood purchased	0.25	0.08	0.71	0.63	0.00	0.00	0.73	0.00	0.33	0.34	0.31	0.49
Charcoal	1.18	0.00	0.07	0.28	0.05	0.16	0.50	0.00	0.86	0.26	0.18	0.58
Paraffin	92.17	90.45	93.91	88.24	97.09	96.19	55.57	67.94	68.54	86.53	92.85	62.18
Gas	0.00	0.03	0.08	0.00	0.00	0.00	0.00	0.00	0.29	0.04	0.02	0.12
Electricity (mains)	3.01	1.41	2.62	1.31	0.52	1.42	42.04	30.41	27.79	8.42	1.52	35.00
Electricity (generator)	0.07	0.25	0.52	0.60	0.00	0.00	0.60	0.00	0.58	0.33	0.28	0.52
Other	0.21	0.46	0.33	0.80	0.00	0.00	0.00	0.00	1.28	0.38	0.34	0.51
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Table 65: Households by Type of Toilet by Province, 1992 (%)

	Coast Rural	Eastern Rural	Central Rural	Rift Valley Rural	Nyanza Rural	Western Rural	Nairobi Urban	Mombasa Urban	Other Urban	Total	Total Rural	Total Urban
Pit	56.26	76.78	95.89	70.32	68.03	91.99	50.20	75.06	64.68	74.07	78.00	58.87
VIP latrine	0.46	2.17	1.65	2.31	1.10	0.26	1.48	6.25	3.94	1.83	1.52	3.02
Bucket	0.00	0.09	0.00	0.17	0.08	0.42	4.34	0.00	0.69	0.59	0.13	2.38
W.C	1.01	0.10	1.12	0.81	1.07	1.04	20.69	11.44	8.94	3.73	0.84	14.92
Pour flush	0.31	0.18	0.83	0.73	0.13	0.64	23.29	3.83	20.70	4.50	0.49	20.00
None	41.96	20.68	0.51	25.66	29.59	5.65	0.00	3.42	1.06	15.28	19.02	0.82
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Table 66: Households by Wall Type by Province, 1992 (%)

	Coast Rural	Eastern Rural	Central Rural	Rift Valley Rural	Nyanza Rural	Western Rural	Nairobi Urban	Mombasa Urban	Other Urban	Total	Total Rural	Total Urban
Mud	76.58	65.61	52.15	76.57	89.34	90.13	32.61	49.91	28.21	65.97	74.55	32.87
Cemented	13.26	12.80	13.66	9.08	8.57	9.60	53.21	49.26	52.89	19.41	10.81	52.62
Wood	1.88	11.58	29.71	12.39	2.00	0.00	9.56	0.00	11.80	10.67	11.02	9.34
Others	8.28	10.01	4.48	1.97	0.10	0.27	4.62	0.84	7.10	3.94	3.62	5.17
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Table 67: Households by Floor Type by Province, 1992 (%)

	Coast Rural	Eastern Rural	Central Rural	Rift Valley Rural	Nyanza Rural	Western Rural	Nairobi Urban	Mombasa Urban	Other Urban	Total	Total Rural	Total Urban
Mud	75.64	76.67	69.19	81.57	87.58	89.85	32.84	27.07	27.08	69.96	80.41	29.88
Cemented	21.39	22.31	26.71	14.78	9.82	9.96	66.46	72.77	71.80	27.87	17.07	69.32
Wood	0.21	0.54	1.62	0.87	0.19	0.00	0.27	0.00	0.23	0.56	0.65	0.22
Others	2.76	0.48	2.48	2.78	2.40	0.19	0.43	0.17	0.89	1.61	1.87	0.58
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Table 68: Households by Roof Type by Province, 1992 (%)

	Coast Rural	Eastern Rural	Central Rural	Rift Valley Rural	Nyanza Rural	Western Rural	Nairobi Urban	Mombasa Urban	Other Urban	Total	Total Rural	Total Urban
Iron sheets	24.80	64.22	85.97	52.51	40.35	42.01	72.94	45.84	74.96	58.48	55.34	70.58
Cemented blocks	0.94	0.34	1.23	0.36	0.58	0.38	10.27	6.66	3.68	1.97	0.60	7.22
Grass/makuti	69.90	34.04	5.84	43.42	57.19	57.04	0.44	34.41	13.74	34.50	40.94	9.70
Tiles	2.68	0.88	2.96	1.40	1.60	0.57	14.32	12.78	5.39	3.45	1.59	10.58
Mud	0.00	0.00	0.11	1.48	0.28	0.00	0.08	0.00	0.00	0.34	0.42	0.04
Tinned	0.82	0.38	3.45	0.04	0.00	0.00	1.65	0.00	0.29	0.80	0.77	0.92
Others	0.85	0.14	0.45	0.79	0.00	0.00	0.30	0.31	1.94	0.47	0.34	0.96
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Table 69: Households by Number of Rooms by Province, 1992 (%)

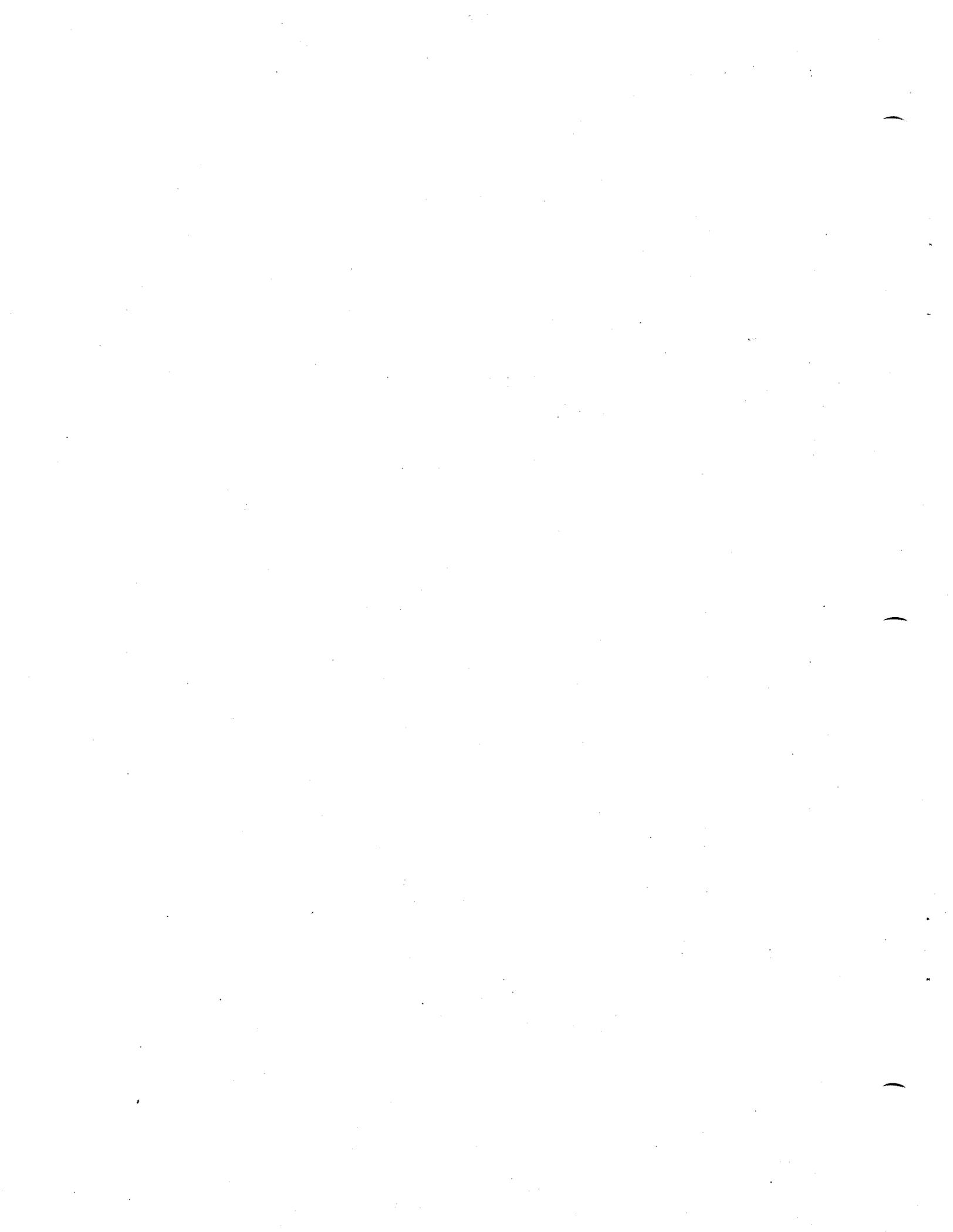
Number of rooms	Coast Rural	Eastern Rural	Central Rural	Rift Valley Rural	Nyanza Rural	Western Rural	Nairobi Urban	Mombasa Urban	Other Urban	Total	Total Rural	Total Urban
0	0.30	0.43	0.08	0.13	0.11	0.00	0.38	0.00	0.38	0.20	0.16	0.34
1	35.48	32.64	9.12	28.93	20.38	31.08	72.97	61.59	61.93	33.56	24.80	67.23
2	23.50	30.27	21.55	42.01	41.27	27.74	12.49	12.56	22.47	29.50	32.88	16.49
3	20.55	22.73	40.48	20.08	30.67	15.91	5.15	14.15	8.43	22.19	26.01	7.51
4	14.58	8.69	17.99	5.55	4.36	17.20	3.38	6.27	5.11	9.10	10.32	4.41
5	2.44	2.63	5.85	1.78	1.60	4.15	2.84	2.05	0.89	2.80	3.02	1.97
6	1.16	1.18	3.14	0.96	0.87	1.75	1.37	1.31	0.39	1.40	1.51	0.97
7	0.80	0.56	1.08	0.09	0.27	0.86	0.25	1.39	0.05	0.50	0.55	0.30
8	0.21	0.18	0.00	0.03	0.03	0.42	0.75	0.58	0.00	0.18	0.12	0.43
9	0.54	0.13	0.29	0.09	0.18	0.32	0.14	0.09	0.11	0.19	0.21	0.12
10	0.00	0.08	0.00	0.05	0.00	0.27	0.25	0.00	0.00	0.08	0.07	0.12
11	0.18	0.00	0.11	0.07	0.09	0.00	0.00	0.00	0.06	0.06	0.06	0.02
12	0.19	0.37	0.00	0.00	0.09	0.09	0.00	0.00	0.00	0.09	0.11	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.02
18	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.00	0.01	0.02	0.00
20	0.06	0.10	0.31	0.04	0.03	0.00	0.00	0.00	0.00	0.08	0.10	0.00
22	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.00
26	0.00	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.02	0.03	0.00
30	0.00	0.00	0.00	0.00	0.06	0.08	0.00	0.00	0.00	0.02	0.02	0.00
40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.01	0.00	0.07
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Mean number of rooms		2.39	2.30	3.11	2.19	2.34	2.55	1.61	1.88	1.68	2.31	2.47

Table 70: Households by Type of Home Ownership by Province, 1992 (%)

	Coast Rural	Eastern Rural	Central Rural	Rift Valley Rural	Nyanza Rural	Western Rural	Nairobi Urban	Mombasa Urban	Other Urban	Total	Total Rural	Total Urban
Owns	83.13	95.52	88.15	83.71	95.66	96.51	7.31	18.68	12.12	74.29	90.87	10.57
Rents	6.20	2.96	4.00	6.07	2.30	1.34	87.42	76.28	82.30	20.29	3.70	84.07
Free	8.66	1.33	7.49	9.76	1.68	2.15	3.68	4.59	4.51	4.84	5.03	4.12
Others	2.01	0.19	0.36	0.47	0.35	0.00	1.59	0.45	1.07	0.57	0.40	1.25
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Text Table 71: Selected Household Indicators in Urban Areas by Poverty Groups, 1992 (%)

	Nairobi			Mombasa		
	All	Poor	Non-Poor	All	Poor	Non-Poor
Household Main Source of Fuel (%)						
Firewood collected	0.43	0.52	0.41	4.83	8.64	3.46
Firewood purchased	1.23	1.17	1.25	2.98	5.59	2.05
Charcoal	3.15	4.20	2.82	16.04	19.83	14.68
Paraffin	78.73	84.15	77.07	70.03	60.60	73.41
Gas	11.76	7.49	13.08	4.88	5.00	4.83
Electricity (mains)	4.63	2.48	5.29	1.16	0.34	1.45
Electricity (generator)	0.00	0.00	0.00	0.00	0.00	0.00
Other	0.06	0.00	0.08	0.09	0.00	0.12
Total	100.00	100.00	100.00	100.00	100.00	100.00
Household Main Source of Lighting (%)						
Firewood collected	0.57	0.00	0.75	1.65	0.97	1.89
Firewood purchased	0.73	1.17	0.60	0.00	0.00	0.00
Charcoal	0.50	0.00	0.65	0.00	0.00	0.00
Paraffin	55.57	68.09	51.72	67.94	72.02	66.48
Gas	0.00	0.00	0.00	0.00	0.00	0.00
Electricity (mains)	42.04	30.74	45.51	30.41	27.01	31.62
Electricity (generator)	0.60	0.00	0.78	0.00	0.00	0.00
Total	100.00	100.00	100.00	100.00	100.00	100.00
Households by Type of Toilet (%)						
Pit	50.20	61.81	46.60	75.06	78.55	73.87
VIP latrine	1.48	0.96	1.64	6.25	2.47	7.53
Bucket latrine	4.34	2.18	5.01	0.00	0.00	0.00
WC	20.69	16.97	21.84	11.44	12.23	11.18
Pour flush	23.29	18.08	24.91	3.83	4.44	3.62
None	0.00	0.00	0.00	3.42	2.31	3.80
Total	100.00	100.00	100.00	100.00	100.00	100.00
Households by Wall-Type (%)						
Mud	32.61	44.81	28.84	49.91	51.34	49.41
Cemented	53.21	37.85	57.95	49.26	48.66	49.47
Wood	9.56	12.66	8.60	0.00	0.00	0.00
Other	4.62	4.68	4.60	0.84	0.00	1.13
Total	100.00	100.00	100.00	100.00	100.00	100.00
Households by Floor-Type (%)						
Mud	32.84	46.78	28.56	27.07	32.92	24.98
Cemented	66.46	52.92	70.61	72.77	67.08	74.79
Wood	0.27	0.09	0.32	0.00	0.00	0.00
Other	0.43	0.21	0.50	0.17	0.00	0.22
Total	100.00	100.00	100.00	100.00	100.00	100.00



METHODOLOGICAL ISSUES

Survey Organization

1. Some of the data from the 1992 Welfare Monitoring Survey, especially on total income and by its components, could not be meaningfully used in the preparation of poverty profiles and in establishing the socio-economic groups. The survey was limited by brevity of the enumerators' reference manual, which was not particularly useful in clarifying concepts. In addition, the data edit in the case of incomes data was not sufficient, otherwise it would have enabled the enumerators and the data edit clerks to ensure that wage employment income for the entire household was equal to or greater than wage employment income for both spouses.
2. In terms of survey organization, the initial steps of preparing an analysis plan for the survey, dummy tables of the most important data from the survey, and a specification of data needs to measure the poverty profiles, do not appear to have been prepared before the survey was launched. It appears that no pilot test on the survey instruments (the questionnaires, the enumerators' reference manual, and dummy tables, if any) was undertaken. In my opinion, the slippage is not related whatsoever to the competence of the staff and the enumerators involved in the survey. It is related to the lapse in taking the necessary steps to conduct a survey, some of which were omitted altogether, and in the complicated and overlapping lines of command. The eventual authority on the quality of survey data was difficult to identify. These issues are outside the scope of work for the poverty profiles, but it would be important to look at the institutional structure, especially the identification of final accountability for the progress in the survey and the quality of data collected.
3. The prevalence, depth and severity of poverty in Nyanza relative to other provinces is partly accounted for by improvements in Siaya district during 1982-92, where prevalence of absolute poverty in 1992 was 40.2 per cent compared with the national rural average of 46.4 per cent. The comparable figures for prevalence of poverty during 1981/82 were 56.4 per cent for Siaya, compared with a national average of 47.9 per cent. The 1993 cycle of the Welfare Monitoring Survey should be used to confirm the shift in the relative position for Siaya and Lamu/Tana River districts. Kajiado/Narok stratum had prevalence of poverty of 42.6 per cent compared to the national average of 47.9 per cent in 1992. The comparable figures for 1982 were 25.1 per cent compared to the national average of 46.4 per cent, probably because some areas like Ngong', Kiserian, Kitengela and Ongata Rongai of Kajiado district are residential areas of some of the higher income class in Nairobi. It would be useful to do purposeful cluster selection in a district-level survey to determine the extent of improvement of Kajiado district as a whole. Unfortunately, it was not possible to study the main sources of income for households in Kajiado/Narok, Siaya and Lamu/Tana River districts, due to the income data problems discussed earlier.
4. In the 1992 Welfare Monitoring Survey, there were dual recall periods for some records e.g. food purchases were recorded for last week and last month; livestock sales from own production were for last month and last year. Unbounded recall over a long period can lead to telescoping error (mis-dating), with consequent over- or under-reporting. It would

be useful to analyze the data by recall periods to ascertain the accuracy of data by recall periods as an input to future survey design, using the analytical methodology used on Ghana data (see Scott and Amenuvegbe, 1990).

Other Supportive Data and Methodological Issues

5. In trying to derive poverty lines for use in the identification of the poor, data needs include calorific value of food intake, and household budget survey data on itemized food consumption and the share of non-food in total expenditure. The database for these indicators used in this report can not be proved to be adequate, e.g. the calorific value of foods. It is necessary to look at the data needs that accompany poverty assessment and identify the necessary surveys or modules to produce the information. The 1993/94 Urban Household Budget Survey will help in filling some of the data gaps.

6. One of the crucial determinants of our results is the adult equivalence scales used in converting consumption expenditure to adult equivalents. The steep scales used in this report can lead to different conclusions about poverty based on the region's household size and the ratios of household members in various age cohorts. It is necessary to revisit the empirical issues of determining the adult equivalence scales in light of changing economic structure, especially the changes in relative prices, the removal of subsidies (cost sharing), and private provision of public goods. It should be noted that changes in equivalence scales arising from levels of provision and quality of public goods reflects the omission of imputed value of publicly-provided goods and services as additional income to the household. The equivalence scales used in the report assume that a single lady with under four-year old quadruplets has the same expenditure as two adults. In addition, equivalence scales in a rural African setting should acknowledge the existence of predominantly male goods (female bads) e.g. alcohol and cigarettes, thereby changing the reference point from adult equivalent to notional adult male. The inappropriateness of the equivalence scales in the case of urban areas is reflected by the wide discrepancy in prevalence of poverty based on households from those based on adult equivalents.

7. In the derivation of price deflators, the report commented on the controversy between price deflators as inter-temporal measures of price comparison, and spatial measures of cost of living. If a poverty line for a given province is used on that province's data to determine the prevalence of poverty, any national poverty line used on deflated data should give the same prevalence of poverty in that province. The margin of error in comparing rural areas should be small, but the margin of error is expected to be fairly large when comparing urban and rural households. For example, the 1992 rural national poverty line used was less than the cost of a nutritionally acceptable diet for Nairobi, before introducing the non-food consumption expenditure at the poverty line. Diewert (1987) shows that the index number formula used in this study to derive regional price deflators fails the symmetric treatment of regions test (region reversal test). The star index (since the numeraire region plays a starring role as all regions are compared with it and it alone) lacks invariance to the choice of the numeraire region. Different choices for the numeraire region give rise to different multilateral indices. Serious thought should be given to methods of deriving reasonable spatial measures of the cost of living when comparing the relative prevalence of rural and urban poverty.

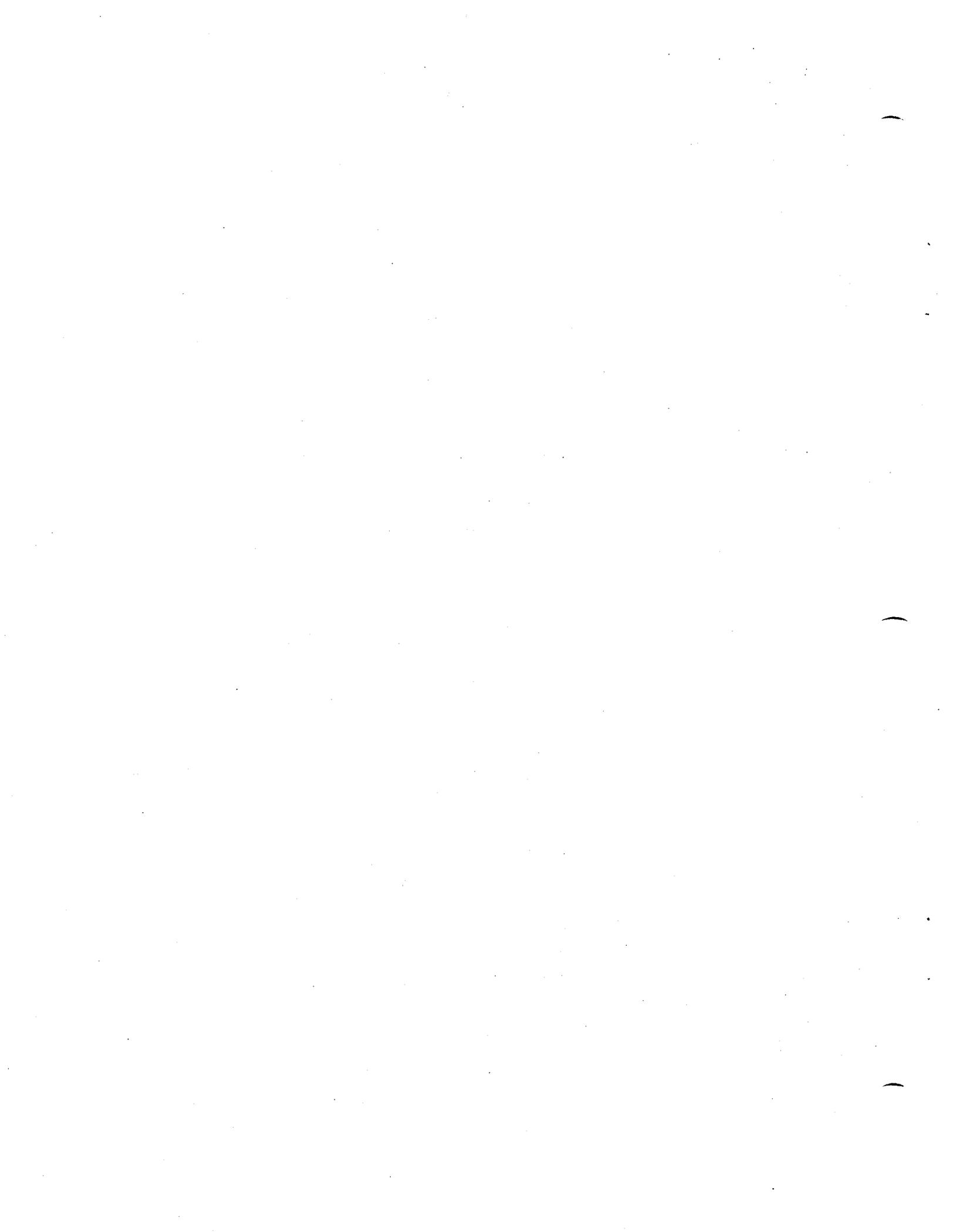
8. In summary, the poverty measures were sensitive to:
- (a) use of constant food weight-to-calorie conversion factors over time and space and regardless of whether the food was fresh or dry. This affects the food poverty line;
 - (b) the choice of adult equivalence scales;
 - (c) regional price deflators; and
 - (d) zero observations on expenditure since a household's $P_{\alpha=1,2}(y)=1$ for $y=0$. Bad data can disguise itself as starvation.

The parameters specified in (a), (b) and (c) above should be studied separately as inputs to creation of poverty profiles since they are sufficient to cause regional rank reversals.

9. The study used the normal sample-to-population blowing up factors (weights) rather than the product of weights and adult equivalents per household due to the sensitivity of the results to the choice of equivalence scales. The steep equivalence scales used in the report may show less poverty among younger couples (with young children) than older couples. The development of robust equivalence scaling should also be accompanied by recommendations on the choice of weighting to be used in blowing the sample observations.

10. However, the issue of weights transcend beyond poverty measures. The weights developed by the Central Bureau of Statistics blow up sample to population estimates, rather than sample households to total households. The weights used should therefore be the sample-to-population weights multiplied by adult equivalents divided by household size. These statistical issues ought to be resolved at a more general level if poverty indices from different countries could be meaningfully compared.

11. Socio-economic groupings based on a one-way classification e.g. level of education or sex of household head might not give meaningful policy interpretation. For example, households with un-educated household heads showed higher prevalence of poverty as did those with "female-other" heads of households. If "female-other" heads were educated (scenario A) or uneducated (scenario B), then "female-other" in scenario A would be a poor segment of the predominantly non-poor households with educated heads of households. Scenario A would focus policy on preventing family disintegration though counselling of educated couples (Responsibility: Ministry of Culture and churches) and less or no education for girls (Responsibility: parents), while scenario B does not merit gender focus since poverty may be minimized through better education for both boys and girls (Responsibility: Ministry of Education). The statistical approach would be to use a probability model, such as the Logit, to predict the odds that a household will be poor and to identify the variables which are significant in determining this occurrence. (see Zaidi and de Vos, 1993).



COMPARISONS OF WEEKLY AND MONTHLY RECALL FOOD PURCHASES DATA

1. A survey design which involves consecutive visits to the same household is said be *bounded* if the recall is based on the period "since my last visit". Under this definition, the reference periods (last week, last month, last year) used in the 1992 Welfare Monitoring Survey were not bounded, which lead to serious telescoping (mis-dating) errors. In addition, the survey period was characterized by unstable and rising commodity prices, which implies that the prevailing prices "last week" and "last month" for the same commodity were different. This factor complicates the interpretation of shares in consumption of items collected under the different recall periods. The analysis in this report were based on food purchases data collected using a monthly recall period.

2. The welfare data on food purchases was collected once with reference to both "last week" and "last month" reference periods. The food items were maize, other cereals, vegetables, meat, dairy products, sugar, beverages, and other food purchases. To make comparisons between the two data sets, the weekly data was multiplied by four so as to be comparable with the monthly data. This was on the assumption that the households make uniform purchases throughout the month, which is unlikely to be in accordance with actual purchasing patterns. To calculate the significance of the differences of the mean purchases by reference periods, percentile shares of households were calculated using weighted number of households, although the T-test of significance was unweighted. One obvious source of error in the approach is that the percentile shares of the population by total household expenditures utilized the expenditure definition which used the monthly recall food purchases data rather than the weekly recall period data.

3. The T-test used is the paired-samples designs. The mean purchase per item by reference period, and the differences between the means are calculated. The statistic used to test the hypothesis that the mean difference in the sample is zero is:

$$t = \frac{\pi}{(S_x/\sqrt{N})}$$

where π is the observed difference between the two means, S_x is the standard deviation of the difference of the paired observations, and N is the number of paired observations. The sampling distribution of t , if the differences are normally distributed with a mean of zero, is Student's t with $N-1$ degrees of freedom. The difference between the mean difference (π) and 0 is measured at 10 per cent significance level. Using a critical value of $t=1.684$ corresponding to the double-sided (two-tail) 10 per cent significance level, if the calculated t -values fall below the critical value, we reject the alternative hypothesis that there is significant difference between π and 0 in favour of the Null Hypothesis H_0 : that $\pi = 0$.

4. The statistics reported in Annex Tables 3.1, 3.2, and 3.3 below include the mean difference (π), the correlation coefficient, and the t value. For example, if the difference between the means is high, but the correlation is high, it implies that there is consistent under-reporting under one reference period. If the difference in the means is high but the correlation is low, it implies that under-reporting under one reference period was not systematic. For example, the rural first 2 deciles' difference between the means for dairy

products was a high 33.27 per cent, but the T-test shows that there is no significant difference between the means ($t=1.38$) since the difference between the observations at the household level were not systematic (correlation=0.139). *Ceteris paribus*, systematic under- or over-reporting under one reference period is expected to make greater difference in computed poverty statistics using the different data sets, than unsystematic differences in observations.

5. For rural 1992, the means for each item for the weekly reference period were higher by 11.27 per cent compared with monthly reference period, except for dairy products. For dairy products, the correlation between the weekly and monthly reference periods was close to zero for most deciles, showing that the difference between the household observations of purchases of dairy products by recall period were not systematic. In addition, the differences between the means by item and in the aggregate decreases with increase in total expenditure. Due to the fact that education is correlated with income, the level of respondent's estimation of item purchases by reference period and the accuracy in telescoping the reference period could increase with education.

6. The urban areas taken for the comparison are Nairobi and Mombasa. On average, the weekly reference period's urban food purchases data was 6.73 per cent over and above the monthly reference period, while the margin is higher for the first five deciles (19.94 per cent) than for the top 5 deciles (1.47 per cent). These results, especially the rural food purchases data, present a serious dilemma since poverty statistics are influenced by the low income households where the difference between the data by reference period appear higher. For urban areas, one would expect the low income households to make more frequent purchases since the income levels might not allow stockpiling of purchased foodstuffs, in addition to the fact that the poor are less likely to own refrigerators to stock food perishables.

7. Annex Table 3.4 shows the count of zero observations in the Welfare Monitoring Survey database for both weekly and monthly reference periods. For every food item purchases, the count of zero observations was higher in the weekly reference period, compared with monthly recall period. Since the data refer to purchases, i.e. exclude own consumption, the existence of a large number of zero values is expected, although the count of zero on the observations appear to be on the higher side. The results imply that the use of weekly reference period food purchases data would have excluded the food purchases which were reported under monthly but omitted from weekly recall period due to low frequency of purchases.

Annex Table 3.1: Test of Significance of Differences between the Means of Weekly and Monthly Recall, Rural 1992						
	Weekly	Monthly	Difference	Difference (%)	Correlation	T-Value
Decile 1-2						
Maize	138.42	95.18	43.24	31.24	0.604	7.92
Cereals	37.68	22.17	15.51	41.15	0.471	6.01
Vegetables	42.24	27.61	14.63	34.64	0.527	6.80
Meat	63.91	42.57	21.33	33.38	0.392	5.65
Dairy products	33.45	22.32	11.13	33.27	0.139	1.38
Sugar	85.50	63.77	21.73	25.42	0.505	9.16
Beverages	37.74	24.89	12.85	34.04	0.400	4.71
Other	4.35	3.01	1.34	30.73	0.327	1.93
Total purchases	443.29	301.53	141.76	31.98	0.359	10.23
Decile 3-4						
Maize	283.17	216.22	66.95	23.64	0.655	6.94
Cereals	75.98	58.43	17.56	23.11	0.612	5.13
Vegetables	70.08	52.50	17.58	25.08	0.494	5.02
Meat	111.91	82.16	29.75	26.58	0.595	8.13
Dairy products	55.92	59.20	(3.28)	(5.86)	0.556	(1.12)
Sugar	144.76	118.66	26.10	18.03	0.473	6.81
Beverages	57.34	41.16	16.18	28.22	0.548	5.63
Other	12.03	9.00	3.03	25.18	0.381	1.64
Total purchases	811.19	637.33	173.87	21.43	0.569	12.59
Decile 5-6						
Maize	407.82	362.24	45.59	11.18	0.695	4.37
Cereals	120.94	94.16	26.77	22.14	0.561	4.91
Vegetables	92.66	78.85	13.81	14.90	0.640	3.93
Meat	163.21	115.70	47.51	29.11	0.422	7.42
Dairy products	81.71	82.16	(0.46)	(0.56)	0.604	(0.13)
Sugar	172.35	152.59	19.76	11.47	0.533	5.77
Beverages	84.70	65.31	19.39	22.89	0.561	4.74
Other	22.31	19.03	3.28	14.71	0.524	1.91
Total purchases	1,145.70	970.04	175.66	15.33	0.591	10.36
Decile 7-8						
Maize	554.31	504.13	50.18	9.05	0.695	3.42
Cereals	190.00	153.71	36.28	19.10	0.669	6.09
Vegetables	123.11	110.50	12.61	10.24	0.597	2.89
Meat	218.57	168.13	50.44	23.08	0.484	7.64
Dairy products	128.85	131.36	(2.50)	(1.94)	0.097	(0.12)
Sugar	227.17	200.52	26.64	11.73	0.448	4.04
Beverages	126.39	102.10	24.29	19.22	0.633	4.85
Other	35.88	34.16	1.72	4.79	0.586	0.70
Total purchases	1,604.28	1,404.62	199.66	12.45	0.490	6.51
Decile 9-10						
Maize	762.82	763.22	(0.40)	(0.05)	0.602	(0.02)
Cereals	306.25	266.98	39.27	12.82	0.529	3.06
Vegetables	215.39	192.43	22.95	10.66	0.398	1.94
Meat	393.83	304.94	88.89	22.57	0.374	5.71
Dairy products	205.08	379.68	(174.60)	(85.14)	0.083	(2.41)
Sugar	308.02	293.80	14.22	4.62	0.586	1.76
Beverages	244.83	209.28	35.55	14.52	0.596	2.99
Other	105.17	77.95	27.22	25.88	0.209	1.16
Total purchases	2,541.38	2,488.28	53.10	2.09	0.349	0.63
Decile 1-10						
Maize	430.12	389.30	40.83	9.49	0.667	6.20
Cereals	146.72	119.63	27.09	18.46	0.592	8.47
Vegetables	109.13	92.76	16.37	15.00	0.486	5.86
Meat	191.11	143.35	47.75	24.99	0.481	12.46
Dairy products	101.37	136.20	(34.82)	(34.35)	0.062	(2.24)
Sugar	187.89	166.26	21.63	11.51	0.587	9.07
Beverages	110.79	89.09	21.71	19.59	0.613	7.57
Other	36.30	28.85	7.45	20.52	0.234	1.53
Total purchases	1,313.43	1,165.44	147.99	11.27	0.508	7.74

Annex Table 3.2: Test of Significance of Differences between the Means of Weekly and Monthly Recall, Rural 1992
(Cumulative Deciles)

	Weekly	Monthly	Difference	Difference (%)	Correlation	T-Value
Decile 1-2						
Maize	138.42	95.18	43.24	31.24	0.604	7.92
Cereals	37.68	22.17	15.51	41.15	0.471	6.01
Vegetables	42.24	27.61	14.63	34.64	0.527	6.80
Meat	63.91	42.57	21.33	33.38	0.392	5.65
Dairy products	33.45	22.32	11.13	33.27	0.139	1.38
Sugar	85.50	63.77	21.73	25.42	0.505	9.16
Beverages	37.74	24.89	12.85	34.04	0.400	4.71
Other	4.35	3.01	1.34	30.73	0.327	1.93
Total purchases	443.29	301.53	141.76	31.98	0.359	10.23
Decile 1-4						
Maize	210.29	155.27	55.01	26.16	0.661	9.96
Cereals	56.69	40.17	16.52	29.15	0.583	7.73
Vegetables	56.06	39.97	16.09	28.71	0.513	7.85
Meat	87.74	62.23	25.51	29.07	0.529	9.69
Dairy products	44.61	40.63	3.98	8.92	0.252	0.92
Sugar	114.92	91.02	23.90	20.80	0.520	10.63
Beverages	47.47	32.97	14.51	30.55	0.493	7.32
Other	8.16	5.99	2.18	26.67	0.370	2.22
Total purchases	625.94	468.24	157.70	25.19	0.556	16.11
Decile 1-6						
Maize	275.58	223.68	51.90	18.83	0.691	10.26
Cereals	77.93	58.02	19.91	25.55	0.586	8.64
Vegetables	68.16	52.82	15.34	22.51	0.585	8.53
Meat	112.68	79.90	32.78	29.09	0.494	11.88
Dairy products	56.87	54.36	2.51	4.42	0.355	0.81
Sugar	133.90	111.37	22.53	16.83	0.546	11.96
Beverages	59.78	43.66	16.12	26.96	0.540	8.51
Other	12.84	10.30	2.54	19.80	0.454	2.93
Total purchases	797.74	634.10	163.64	20.51	0.640	18.98
Decile 1-8						
Maize	344.20	292.72	51.48	14.96	0.712	9.80
Cereals	105.52	81.58	23.94	22.69	0.648	10.52
Vegetables	81.69	67.02	14.67	17.96	0.599	8.48
Meat	138.75	101.62	37.13	26.76	0.516	14.06
Dairy products	74.59	73.31	1.28	1.71	0.172	0.22
Sugar	156.86	133.32	23.54	15.01	0.530	10.91
Beverages	76.18	58.05	18.13	23.80	0.598	9.61
Other	18.51	16.17	2.34	12.64	0.529	2.62
Total purchases	996.30	823.80	172.50	17.31	0.645	17.31
Decile 1-10						
Maize	430.12	389.30	40.83	9.49	0.667	6.20
Cereals	146.72	119.63	27.09	18.46	0.592	8.47
Vegetables	109.13	92.76	16.37	15.00	0.486	5.86
Meat	191.11	143.35	47.75	24.99	0.481	12.46
Dairy products	101.37	136.20	(34.82)	(34.35)	0.062	(2.24)
Sugar	187.89	166.26	21.63	11.51	0.587	9.07
Beverages	110.79	89.09	21.71	19.59	0.613	7.57
Other	36.30	28.85	7.45	20.52	0.234	1.53
Total purchases	1,313.43	1,165.44	147.99	11.27	0.508	7.74

Annex Table 3.3: Test of Significance of Differences between the Means of Weekly and Monthly Recall, Urban 1992

(Nairobi and Mombasa)

	Weekly	Monthly	Difference	Difference (%)	Correlation	T-Value
Decile 1-5						
Maize	249.60	210.12	39.49	15.82	0.742	5.82
Cereals	138.23	107.05	31.18	22.56	0.573	4.90
Vegetables	149.00	124.05	24.95	16.75	0.526	3.97
Meat	201.35	166.73	34.62	17.20	0.656	5.64
Dairy products	154.13	149.57	4.56	2.96	0.708	1.24
Sugar	163.67	98.13	65.55	40.05	0.065	1.49
Beverages	117.36	82.48	34.88	29.72	0.639	4.39
Other	62.55	51.39	11.16	17.84	0.244	1.77
Total purchases	1,235.91	989.52	246.39	19.94	0.376	5.08
Decile 6-10						
Maize	460.47	435.05	25.42	5.52	0.752	1.46
Cereals	418.12	373.54	44.58	10.66	0.758	3.30
Vegetables	391.95	354.52	37.43	9.55	0.892	4.35
Meat	527.06	485.35	41.71	7.91	0.815	3.41
Dairy products	398.66	566.17	(167.51)	(42.02)	0.180	(1.62)
Sugar	210.54	211.14	(0.60)	(0.28)	0.830	(0.13)
Beverages	474.50	407.35	67.15	14.15	0.775	3.07
Other	240.64	242.94	(2.30)	(0.96)	0.492	(0.13)
Total purchases	3,121.95	3,076.06	45.89	1.47	0.552	0.40
Decile 1-10						
Maize	354.70	322.18	32.53	9.17	0.759	3.49
Cereals	278.03	240.20	37.84	13.61	0.773	5.08
Vegetables	270.12	238.94	31.18	11.54	0.871	5.86
Meat	363.80	325.67	38.13	10.48	0.830	5.58
Dairy products	276.28	357.52	(81.24)	(29.41)	0.212	(1.57)
Sugar	186.99	154.48	32.50	17.38	0.147	1.46
Beverages	295.88	244.67	51.21	17.31	0.782	4.41
Other	151.41	146.94	4.47	2.95	0.513	0.47
Total purchases	2,177.20	2,030.60	146.61	6.73	0.596	2.38

Annex Table 3.4: Count of Zero Observations in the Database, Rural and Urban 1992

	Rural		Urban	
	Weekly	Monthly	Weekly	Monthly
Maize	2,491	2,119	62	32
Cereals	3,634	2,958	174	135
Vegetables	2,436	2,032	32	30
Meat	2,364	1,485	90	61
Dairy products	3,732	3,373	95	87
Sugar	864	417	76	28
Beverages	2,839	2,442	319	269
Other	5,156	4,777	357	305
Total purchases	111	54	4	5
Total Cases	6,358	6,358	1,099	1,099

CONFIDENCE INTERVAL AND HYPOTHESIS TESTING

METHODOLOGY

1. Tests of significance by region and socio-economic groups were to be conducted on the mean adult equivalent expenditures, on the $P_{\alpha=0,1,2}$, and on the Gini index of concentration. The tests of significance of $P_{\alpha=0,1,2}$ were also used to test whether a region's or socio-economic group's poverty measure is significantly greater than zero. The statistical inference of whether there is significant difference in the sample means was determined by the use of Student's t -test. The Null Hypothesis $H_0: \mu_1 = \mu_2$, is that there is no statistically significant difference in the sample means, where μ_1 and μ_2 are the means of the two samples. The test is conducted at 0.05 significance levels, corresponding to a double-sided critical value of $t=1.96$. The sample means and the sample variances, S_1^2 and S_2^2 , are computed so as to generate the pooled t -values (assuming the two populations have a common unknown variance), and separate-variance t -values (assuming unequal variances). The statistic used to test the hypothesis that the two population variances are equal is the F -test, which is the ratio of the larger sample variance to the smaller. If the observed significance level for F test is small, the hypothesis that the population variances are equal is rejected, and the separate variance t -test for means is used. The critical values of t -statistic are read in the nomogram available in most statistics textbooks.

2. Kakwani (1990b) provides the methodology for testing whether the difference between observed measurements of P_α from any two independently drawn samples n_1 and n_2 is statistically significant. The test statistic is:

$$\hat{\Omega} = \frac{(P_{\alpha,A} - P_{\alpha,B})}{\sqrt{[(\sigma_{\alpha,A}^2/n_1)/(\sigma_{\alpha,B}^2/n_2)]}}$$

where $\sigma_{\alpha,A}^2$ and $\sigma_{\alpha,B}^2$ are the variances of the poverty measures for populations A and B , respectively. The statistic $\hat{\Omega}$ follows asymptotic normal distribution with zero mean, unit variance and ∞ degrees of freedom (Cramer, 1946). P_α measures have variance $P_{2\alpha} - P_\alpha^2$.

3. If g_i is the poverty gap ratio, the variance of g_i is given by:

$$\sigma^2 = (\sum g_i^2 - N\Theta^2)/(N-1), \text{ where } \Theta \text{ is the mean of } g_i;$$

while $P_{\alpha=2} - P_{\alpha=1}^2 = (\sum g_i^2 - N\Theta^2)/N \approx \sigma^2$ for large N .

4. For $\alpha=0$, $P_{2\alpha} = P_\alpha = H$ (the natural estimator of the head count ratio). Hence, $P_{\alpha=0}$ measure is a binomial variate with parameters n and $f(z)$, where $f(z) = 1$ for all $Y < z$, and 0 otherwise. Therefore, the variance of $H = P_{2\alpha} - P_\alpha^2 = (H - H^2)/n = H(1-H)/n$. Similarly the variance of $P_{\alpha=1} = P_{\alpha=2} - P_{\alpha=1}^2$, while the variance of $P_{\alpha=2} = P_{\alpha=4} - P_{\alpha=2}^2$. The above tests of significance of poverty measures were used to test the significance of differences in P_α measures by regions and socio-economic groups.

5. For $P_{\alpha=0}$, the only important information is whether the household is "below" the poverty line [$f(z)=1$ for all $Y < z$] or "not below" [$f(z)=0$ for all $Y \geq z$], and it is therefore considered a *Bernoulli trial*. To compute the confidence interval for $P_{\alpha=1,2}$, the distribution function is first *censored* at the poverty line, i.e. $f(Y,z)=z$ for all $Y \geq z$. Two household level variables are then computed:

$$g_i = (z-Y)/z; \text{ and}$$

$$g_i^2 = [(z-Y)/z]^2$$

Let the normal sample-to-population blowing up factors, i.e. weights, be w and the number of adult equivalents in the household be ξ . A t -test is then conducted on $P_{\alpha=1}$ (i.e. g_i) and $P_{\alpha=2}$ (i.e. g_i^2) by weighting data by $w\xi$, i.e. the product of sample-to-population weights and the adult equivalents in the household, since $P_{\alpha=1,2}$ are computed by adult equivalents rather than by households. A one-sample t -test can be conducted to test whether a particular region's or socio-economic group's $P_{\alpha=1,2}$ is significantly different from zero, while a two independent samples t -test is used to test the statistical significance of differences in mean $P_{\alpha=1,2}$. Since the provincial sample sizes are large, the sampling distribution of the difference between $P_{\alpha=0}$ by regions or socio-economic groups will be approximated with a normal distribution. Hence the t -test of significance between means of two independent samples will be used for the three poverty measures, $P_{\alpha=0,1,2}$.

6. To test whether a region's or socio-economic group's poverty measure is significantly greater than zero, a t -statistic is calculated as the ratio of the mean to the standard error. If N is the sample size, σ is the standard deviation, and μ is the sample mean of the poverty measure $P_{\alpha=1,2}$, the standard error is σ/\sqrt{N} , and the computed t -statistic is given by $\mu/(\sigma/\sqrt{N})$.

7. To construct tests of hypothesis that the difference between two Gini coefficients of concentration G_1 and G_2 estimated from independently drawn samples n_1 and n_2 , respectively, is significantly greater than zero, the test statistic is:

$$\hat{\eta} = \frac{(G_1 - G_2)}{\sqrt{[(\sigma^2_{G_1}/n_1)/(\sigma^2_{G_2}/n_2)']}}$$

8. Following Kakwani (1990a), an approximate test of the null is to reject H_0 if $|\hat{\eta}| > m_{\alpha}(k, \infty)$ where $m_{\alpha}(k, \infty)$ is the upper α critical value of the normal distribution with mean zero, unit variance and ∞ degrees of freedom. However, tests of significance between various regions' or socio-economic groups' Gini coefficients of concentration were not conducted due to unavailability of an appropriate computer software package.

9. Fraser's (1957) formulation of the sample (case level) estimator of the Gini index when total household expenditures are ranked in ascending order, x_{im} denote the mean of the first i households in a sample x_1, \dots, x_n , and $p_i = i/n$, is given by:

$$G_i = d_i/2x_{im}, \quad \text{where}$$

$$d_i = [n/(n-1)][2(x_i - x_{im})p_i - (x_i - x_{im})]$$

10. With large samples, it is rather rare for differences between means of a case-level variable from two samples to be insignificant. We should therefore be cautious not to report our findings as though they were of high practical importance. In the case of poverty measures, the difficulty in the interpretation of statistical tests of significance from large samples dilutes the direct policy relevance of the results.

TESTS OF SIGNIFICANCE OF MEAN PROVINCIAL ADULT EQUIVALENT EXPENDITURES, 1982, 1992

11. Annex Table 4.1 shows the results of statistical tests of significance of mean provincial adult equivalent expenditures for 1981-82 and 1992. The statistics shown are the F-value (i.e. the ratio of the larger sample variance to the smaller) and the *t*-statistic. If the provincial mean on the top row heading is greater than that of the province on the column heading, the *t*-statistic shown in the Table is positive. During 1982, the mean provincial adult equivalent expenditures were significantly different for all pairs of provinces at 5 per cent significance level. The mean difference of provincial adult equivalent expenditures were small for Coast, Eastern and Rift Valley provinces, but the means were significantly different due to higher variances of expenditure in Nyanza, followed by Rift Valley compared with Coast. Relatively larger variances imply greater expenditure concentration, as demonstrated by relatively higher Gini coefficients of concentration.

12. In 1992, the provincial mean adult equivalent expenditures were statistically significant for all pairs of provinces, although the difference in the means for Coast and Eastern were not significantly different from each other under less restrictive assumptions e.g. the procedure of multiple comparisons due to Scheffé (1959). The means for Coast and Eastern were close but the difference was statistically significant due to larger variance in Eastern province, denoting greater inequality in Eastern province compared with Coast - as shown by the value of F-statistic and the relative Gini coefficients of expenditure concentration. Similarly, the mean difference for Rift Valley and Nyanza was small but the means were significantly different due to higher variance in adult equivalent expenditures in Nyanza, denoting higher concentration of adult equivalent expenditure in Nyanza compared with Rift Valley.

TESTS OF SIGNIFICANCE FOR MEAN POVERTY MEASURES, 1982, 1992

13. Annex Tables 4.2, 4.3, 4.4 and 4.5 shows the *t*-statistics for the head count ratio $P_{\alpha=0}$ for rural 1982 and rural 1992 by pairs of provinces and pairs of selected socio-economic grouping schemes. The results show that, for all pairs of provinces and socio-economic groups, the means were significantly different for both rural 1982 and rural 1992. The only exception was the 1992 pairing of age of household head of "below 25" and 26-30 years, where the *t*-statistic was 1.16, and the corresponding $P_{\alpha=0}$ were 0.3600 and 0.3591. The result is hardly surprising since the mean $P_{\alpha=0}$ for the two age groups were close and the groups sample sizes were small, corresponding to 3.3 per cent and 8.64 per cent of total adult equivalent population, respectively.

14. Annex Tables 4.6 and 4.7 shows the rural 1982 and 1992 provincial $P_{\alpha=1,2}$ poverty

Annex Table 4.21:

Sampling Errors of Adult Equivalent Expenditure Poverty Measures ($P_{a-1,2}$), 1992

(Absolute poverty line, Rural: Shs 484.98; Urban: Shs 1009.70)

	P_{a-1}	Std Error	$P_{a-1}-2SE$	$P_{a-1}+2SE$	P_{a-2}	Std Error	$P_{a-2}-2SE$	$P_{a-2}+2SE$
COAST RURAL	0.15381	0.00024	0.15333	0.15430	0.07629	0.00016	0.07597	0.07660
Kilifi	0.17441	0.00042	0.17358	0.17524	0.08745	0.00027	0.08692	0.08799
Kwale	0.16289	0.00036	0.16217	0.16361	0.07618	0.00023	0.07571	0.07665
Lamu/Tana River	0.09251	0.00052	0.09147	0.09356	0.05460	0.00036	0.05387	0.05533
EASTERN RURAL	0.14932	0.00013	0.14905	0.14959	0.07416	0.00009	0.07398	0.07433
Embu	0.17497	0.00051	0.17394	0.17600	0.09594	0.00036	0.09522	0.09667
Kimii	0.19551	0.00032	0.19486	0.19616	0.09035	0.00022	0.08991	0.09079
Machakos/Makueni	0.15703	0.00022	0.15660	0.15746	0.07673	0.00014	0.07645	0.07701
Meru/Tharaka	0.11280	0.00021	0.11238	0.11322	0.05845	0.00014	0.05816	0.05873
CENTRAL RURAL	0.12086	0.00013	0.12061	0.12111	0.05426	0.00007	0.05411	0.05441
Kiambu	0.11867	0.00022	0.11823	0.11910	0.05270	0.00012	0.05247	0.05293
Kirinyaga	0.14199	0.00041	0.14118	0.14281	0.06470	0.00024	0.06422	0.06517
Murang'a	0.12167	0.00024	0.12119	0.12215	0.05609	0.00015	0.05580	0.05639
Nyandarua	0.09815	0.00034	0.09746	0.09884	0.03929	0.00020	0.03888	0.03969
Nyeri	0.12343	0.00030	0.12284	0.12402	0.05618	0.00018	0.05582	0.05654
RIFT VALLEY RURAL	0.22292	0.00015	0.22263	0.22321	0.12691	0.00011	0.12670	0.12713
Kajiado/Narok	0.08630	0.00029	0.08572	0.08688	0.04098	0.00017	0.04064	0.04133
Kericho/Bomet	0.27868	0.00030	0.27808	0.27928	0.15390	0.00022	0.15346	0.15433
Laikipia	0.13715	0.00060	0.13594	0.13835	0.07349	0.00041	0.07266	0.07432
Nakuru	0.22223	0.00037	0.22149	0.22296	0.12755	0.00025	0.12705	0.12805
Nandi	0.22599	0.00039	0.22522	0.22676	0.10765	0.00025	0.10714	0.10815
Baringo	0.13274	0.00048	0.13178	0.13369	0.06105	0.00031	0.06043	0.06168
E. Marakwet	0.20967	0.00062	0.20843	0.21090	0.10684	0.00042	0.10600	0.10767
Trans Nzoia/U. Gishu	0.24261	0.00036	0.24190	0.24332	0.15184	0.00027	0.15130	0.15238
W. Pokot	0.35364	0.00084	0.35196	0.35531	0.25558	0.00076	0.25406	0.25710
NYANZA RURAL	0.19732	0.00015	0.19701	0.19762	0.10643	0.00010	0.10622	0.10664
Kisii	0.20517	0.00033	0.20451	0.20582	0.11524	0.00023	0.11479	0.11570
Kisumu	0.15116	0.00037	0.15042	0.15190	0.07711	0.00024	0.07662	0.07760
Siaya	0.15388	0.00029	0.15330	0.15446	0.07698	0.00018	0.07662	0.07733
Homa Bay/Migori	0.23375	0.00030	0.23315	0.23434	0.12858	0.00020	0.12817	0.12899
Nyamira	0.23007	0.00048	0.22911	0.23103	0.12525	0.00032	0.12461	0.12589
WESTERN RURAL	0.22966	0.00018	0.22929	0.23002	0.12570	0.00013	0.12544	0.12596
Bungoma	0.25161	0.00036	0.25090	0.25233	0.15158	0.00027	0.15104	0.15213
Busia	0.33261	0.00046	0.33169	0.33352	0.19581	0.00034	0.19512	0.19650
Kakamega/Vihiga	0.17908	0.00022	0.17865	0.17951	0.08460	0.00013	0.08434	0.08486
TOTAL RURAL	0.18368	0.00006	0.18356	0.18381	0.09751	0.00004	0.09742	0.09759
URBAN	0.08925	0.00017	0.08892	0.08958	0.03944	0.00010	0.03924	0.03965
Nairobi	0.07677	0.00018	0.07641	0.07714	0.03420	0.00012	0.03397	0.03444
Mombasa	0.13255	0.00037	0.13181	0.13329	0.05763	0.00021	0.05720	0.05805



Annex Table 4.12: Testing for Significance of Differences in Provincial P_{a-1} , Rural 1992
(Absolute poverty line, Shs 484.98)

	Coast	Eastern	Central	Rift/V	Nyanza	Western
Coast						
F-value						
χ^2 -value						
Eastern						
F-value	1.01					
χ^2 -value	16.24					
Central						
F-value	1.33	1.31				
χ^2 -value	128.49	153.48				
Rift/Valley						
F-value	1.47	1.49	1.95			
χ^2 -value	(216.83)	(364.17)	(499.07)			
Nyanza						
F-value	1.28	1.30	1.70	1.14		
χ^2 -value	(141.53)	(236.15)	(378.32)	119.94		
Western						
F-value	1.39	1.41	1.84	1.06	1.08	
χ^2 -value	(232.99)	(365.05)	(501.64)	(28.75)	(136.83)	
Mean P_{a-1}	0.1538	0.1493	0.1209	0.2229	0.1973	0.2297

Annex Table 4.13: Testing for Significance of Differences in Provincial P_{a-2} , Rural 1992
(Absolute poverty line, Shs 484.98)

	Coast	Eastern	Central	Rift/V	Nyanza	Western
Coast						
F-value						
χ^2 -value						
Eastern						
F-value	1.03					
χ^2 -value	11.63					
Central						
F-value	1.66	1.72				
χ^2 -value	142.04	169.19				
Rift/Valley						
F-value	1.84	1.78	3.05			
χ^2 -value	(221.39)	(369.19)	(512.81)			
Nyanza						
F-value	1.36	1.31	2.26	1.35		
χ^2 -value	(147.22)	(237.60)	(402.51)	136.14		
Western						
F-value	1.65	1.60	2.74	1.11	1.22	
χ^2 -value	(217.67)	(339.72)	(495.75)	7.17	(118.43)	
Mean P_{a-2}	0.0763	0.0742	0.0543	0.1269	0.1064	0.1257

Annex Table 4.14: Testing for Significance of Differences in Provincial $P_{\alpha-1}$, Rural 1992
(Absolute hard core poverty line, Shs 404.66)

	Coast	Eastern	Central	Rift/V	Nyanza	Western
Coast						
F-value						
χ^2 -value						
Eastern						
F-value	1.01					
χ^2 -value	16.50					
Central						
F-value	1.48	1.47				
χ^2 -value	129.32	150.49				
Rift/Valley						
F-value	1.62	1.63	2.40			
χ^2 -value	(224.18)	(378.51)	(508.55)			
Nyanza						
F-value	1.33	1.34	1.97	1.22		
χ^2 -value	(156.03)	(258.91)	(401.14)	116.67		
Western						
F-value	1.51	1.53	2.24	1.07	1.14	
χ^2 -value	(226.55)	(358.60)	(495.06)	(7.37)	(113.48)	
Mean $P_{\alpha-1}$	0.1088	0.1048	0.0809	0.1740	0.1514	0.1756

Annex Table 4.15: Testing for Significance of Differences in Provincial $P_{\alpha-2}$, Rural 1992
(Absolute hard core poverty line, Shs 404.66)

	Coast	Eastern	Central	Rift/V	Nyanza	Western
Coast						
F-value						
χ^2 -value						
Eastern						
F-value	1.07					
χ^2 -value	7.27					
Central						
F-value	1.88	2.01				
χ^2 -value	146.82	176.12				
Rift/Valley						
F-value	2.06	1.92	3.87			
χ^2 -value	(214.65)	(354.36)	(500.19)			
Nyanza						
F-value	1.39	1.29	2.60	1.49		
χ^2 -value	(141.23)	(221.47)	(397.68)	143.77		
Western						
F-value	1.81	1.69	3.39	1.14	1.31	
χ^2 -value	(201.02)	(310.36)	(472.81)	24.24	(108.85)	
Mean $P_{\alpha-2}$	0.0520	0.0509	0.0337	0.0953	0.0764	0.0917

Annex Table 4.16: Testing for Significance of Differences in P_{a-1} by Socio-economic Groups, Rural 1982
(Absolute poverty line, Shs 105.94)

Sex of Household Head		Male	Female		
Male					
F-value					
χ^2 -value					
Female					
F-value	1.12				
χ^2 -value	155.00				
Mean P_{a-1}	0.1554	0.1316			
Sex/marital status of Household Head					
		Male- Married	Male- Other	Female Married	Female Other
Male-married					
F-value					
χ^2 -value					
Male-other					
F-value	1.00				
χ^2 -value	94.04				
Female-married					
F-value	1.17	1.18			
χ^2 -value	167.33	(10.69)			
Female-other					
F-value	1.05	1.05	1.12		
χ^2 -value	72.31	(47.52)	(61.61)		
Mean P_{a-1}	0.1570	0.1207	0.1249	0.1409	
Education status of Household Head					
		None	Primary	Secondary	
None					
F-value					
χ^2 -value					
Primary					
F-value	1.38				
χ^2 -value	506.74				
Secondary					
F-value	2.73	1.97			
χ^2 -value	446.25	253.03			
Mean P_{a-1}	0.1861	0.1163	0.0494		

Age of Household Head

	≤ 25	26-30	31-40	41-49	Over 50
≤ 25					
F-value					
χ^2 -value					
26-30					
F-value	1.18				
χ^2 -value	12.25				
31-40					
F-value	1.03	1.15			
χ^2 -value	(95.84)	(165.71)			
41-49					
F-value	1.37	1.61	1.41		
χ^2 -value	(212.64)	(346.37)	(251.13)		
Over 50					
F-value	1.29	1.51	1.32	1.07	
χ^2 -value	(212.99)	(358.98)	(262.67)	24.24	
Mean $P_{\alpha-1}$	0.0955	0.0914	0.1264	0.1757	0.1711

Annex Table 4.17: Testing for Significance of Differences in $P_{a=2}$ by Socio-economic Groups, Rural 1982
(Absolute poverty line, Shs 105.94)

Sex of Household Head

	Male	Female
Male		
F-value		
χ^2 -value		
Female		
F-value	1.13	
χ^2 -value	131.38	
Mean $P_{a=2}$	0.0666	0.0553

Sex/marital status of Household Head

	Male- Married	Male- Other	Female Married	Female Other
Male-married				
F-value				
χ^2 -value				
Male-other				
F-value	1.11			
χ^2 -value	45.85			
Female-married				
F-value	1.22	1.35		
χ^2 -value	143.36	24.87		
Female-other				
F-value	1.03	1.14	1.18	
χ^2 -value	53.92	(13.18)	(59.71)	
Mean $P_{a=2}$	0.0670	0.0571	0.0517	0.0603

Education status of Household Head

	None	Primary	Secondary
None			
F-value			
χ^2 -value			
Primary			
F-value	1.56		
χ^2 -value	439.62		
Secondary			
F-value	3.79	2.43	
χ^2 -value	353.50	196.11	
Mean $P_{a=2}$	0.0814	0.0474	0.0196

Age of Household Head

	≤ 25	26-30	31-40	41-49	Over 50
≤ 25					
F-value					
χ^2 -value					
26-30					
F-value	1.43				
χ^2 -value	32.79				
31-40					
F-value	1.40	1.02			
χ^2 -value	(35.94)	(110.59)			
41-49					
F-value	1.36	1.95	1.91		
χ^2 -value	(156.12)	(290.41)	(264.35)		
Over 50					
F-value	1.19	1.70	1.67	1.14	
χ^2 -value	(148.87)	(288.92)	(257.99)	41.93	
Mean $P_{\alpha=2}$	0.0438	0.0378	0.0498	0.0783	0.0738

Annex Table 4.18: Testing for Significance of Differences in P_{a-1} by Socio-economic Groups, Rural 1992
(Absolute poverty line, Shs 484.98)

Sex of Household Head

	Male	Female
Male		
F-value		
χ^2 -value		
Female		
F-value	1.01	
χ^2 -value	(33.24)	
Mean P_{a-1}	0.1827	0.1876

Sex/marital status of Household Head

	Male-Married	Male-Other	Female Married	Female Other
Male-married				
F-value				
χ^2 -value				
Male-other				
F-value	1.12			
χ^2 -value	32.64			
Female-married				
F-value	1.15	1.03		
χ^2 -value	114.08	29.07		
Female-other				
F-value	1.09	1.22	1.26	
χ^2 -value	(168.83)	(116.78)	(222.30)	
Mean P_{a-1}	0.1833	0.1720	0.1617	0.2183

Education status of Household Head

	None	Primary	Secondary
None			
F-value			
χ^2 -value			
Primary			
F-value	1.26		
χ^2 -value	331.14		
Secondary			
F-value	2.48	1.97	
χ^2 -value	740.17	545.53	
Mean P_{a-1}	0.2378	0.1762	0.0845

Age of Household Head

	≤ 25	26-30	31-40	41-49	Over 50
≤ 25					
F-value					
χ^2 -value					
26-30					
F-value	1.37				
χ^2 -value	68.83				
31-40					
F-value	1.01	1.35			
χ^2 -value	(47.93)	(180.17)			
41-49					
F-value	1.20	1.64	1.21		
χ^2 -value	(136.49)	(307.50)	(199.22)		
Over 50					
F-value	1.29	1.77	1.31	1.08	
χ^2 -value	(189.84)	(396.49)	(349.10)	(119.94)	
Mean $P_{\alpha-1}$	0.1404	0.1161	0.1573	0.1933	0.2150

Annex Table 4.19: Testing for Significance of Differences in $P_{\alpha-2}$ by Socio-economic Groups, Rural 1992
(Absolute poverty line, Shs 484.98)

Sex of Household Head		Male	Female		
Male					
F-value					
χ^2 -value					
Female					
F-value		1.01			
χ^2 -value		(10.07)			
Mean $P_{\alpha-2}$		0.0974	0.0985		
Sex/marital status of Household Head					
		Male- Married	Male- Other	Female Married	Female Other
Male-married					
F-value					
χ^2 -value					
Male-other					
F-value		1.14			
χ^2 -value		45.49			
Female-married					
F-value		1.19	1.05		
χ^2 -value		123.28	21.66		
Female-other					
F-value		1.14	1.29	1.35	
χ^2 -value		(139.41)	(111.19)	(204.78)	
Mean $P_{\alpha-2}$		0.0980	0.0872	0.0820	0.1179
Education status of Household Head					
		None	Primary	Secondary	
None					
F-value					
χ^2 -value					
Primary					
F-value		1.51			
χ^2 -value		320.61			
Secondary					
F-value		4.19	2.77		
χ^2 -value		664.31	488.25		
Mean $P_{\alpha-2}$		0.1316	0.0909	0.0375	

Age of Household Head

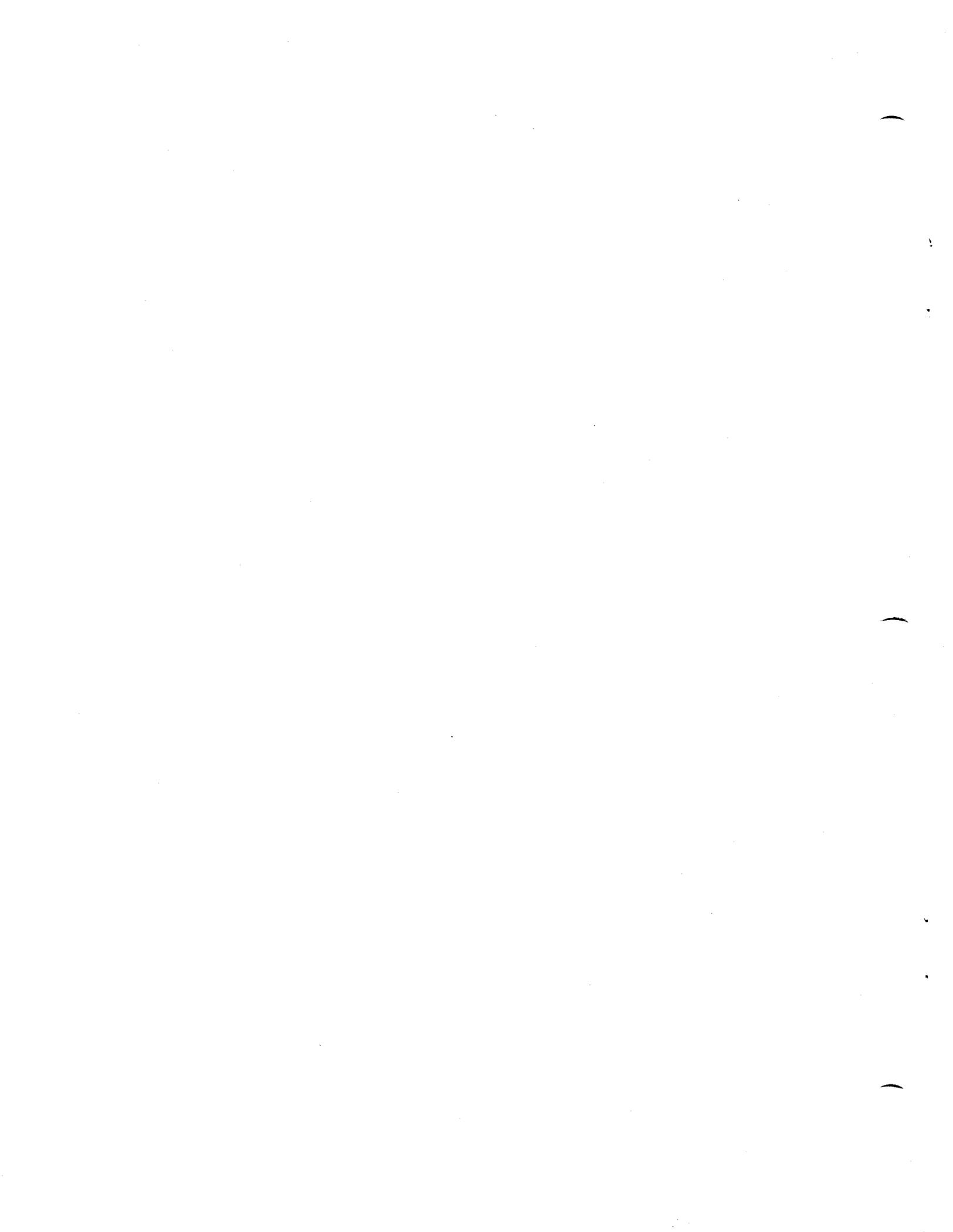
	≤ 25	26-30	31-40	41-49	Over 50
≤ 25					
F-value					
χ^2 -value					
26-30					
F-value	1.75				
χ^2 -value	91.97				
31-40					
F-value	1.16	1.51			
χ^2 -value	(18.35)	(170.96)			
41-49					
F-value	1.12	1.95	1.29		
χ^2 -value	(107.33)	(294.85)	(199.39)		
Over 50					
F-value	1.29	2.26	1.50	1.16	
χ^2 -value	(153.72)	(367.24)	(336.10)	(112.24)	
Mean $P_{\alpha=2}$	0.0752	0.0540	0.0795	0.1037	0.1179

Annex Table 4.20:

Sampling Errors of Adult Equivalent Expenditure Poverty Measures ($P_{a-1,2}$), 1982

(Absolute poverty line, Shs 105.94)

	P_{a-1}	Std Error	$P_{a-1}-2SE$	$P_{a-1}+2SE$	P_{a-2}	Std Error	$P_{a-2}-2SE$	$P_{a-2}+2SE$
COAST RURAL	0.18591	0.00025	0.18542	0.18641	0.08165	0.00015	0.08135	0.08194
Kilifi, Tana & Lamu	0.23414	0.00025	0.23364	0.23464	0.10760	0.00014	0.10733	0.10787
Kwale	0.12078	0.00036	0.12005	0.12150	0.04617	0.00018	0.04581	0.04653
Taita Taveta	0.11365	0.00061	0.11243	0.11488	0.04355	0.00035	0.04285	0.04425
EASTERN RURAL	0.14038	0.00011	0.14016	0.14060	0.05730	0.00005	0.05720	0.05740
Machakos	0.11648	0.00027	0.11595	0.11701	0.03836	0.00017	0.03802	0.03870
Kitui	0.27182	0.00030	0.27122	0.27242	0.13175	0.00016	0.13142	0.13207
Meru	0.10270	0.00021	0.10227	0.10312	0.04388	0.00010	0.04368	0.04409
Embu	0.10856	0.00042	0.10772	0.10940	0.03820	0.00023	0.03774	0.03866
CENTRAL RURAL	0.06742	0.00010	0.06722	0.06762	0.02668	0.00005	0.02658	0.02677
Nyeri	0.04962	0.00019	0.04925	0.05000	0.01784	0.00007	0.01771	0.01798
Murang'a	0.04355	0.00030	0.04294	0.04415	0.01283	0.00016	0.01250	0.01315
Kirinyaga	0.13751	0.00035	0.13681	0.13821	0.06031	0.00021	0.05989	0.06074
Kiambu	0.06347	0.00023	0.06301	0.06392	0.02877	0.00010	0.02857	0.02898
Nyandarua	0.09368	0.00038	0.09293	0.09443	0.03437	0.00020	0.03398	0.03477
RIFT VALLEY RURAL	0.16743	0.00014	0.16715	0.16771	0.07344	0.00008	0.07328	0.07360
Nakuru	0.12794	0.00037	0.12721	0.12867	0.05535	0.00021	0.05494	0.05576
Nandi	0.15635	0.00049	0.15537	0.15732	0.06898	0.00028	0.06842	0.06953
Kajiado, Narok	0.14175	0.00037	0.14100	0.14250	0.06286	0.00019	0.06247	0.06325
Kericho	0.17616	0.00033	0.17550	0.17682	0.06799	0.00018	0.06763	0.06836
Uasin Gishu	0.17424	0.00049	0.17325	0.17522	0.07674	0.00027	0.07620	0.07729
Trans Nzoia	0.18085	0.00048	0.17988	0.18181	0.08051	0.00027	0.07997	0.08104
Baringo, Laikipia	0.14366	0.00055	0.14256	0.14476	0.06029	0.00035	0.05959	0.06099
W. Pokot/Eigeyo M.	0.26442	0.00047	0.26347	0.26536	0.13695	0.00027	0.13641	0.13748
NYANZA RURAL	0.17916	0.00018	0.17880	0.17952	0.07660	0.00010	0.07639	0.07681
South Nyanza	0.19979	0.00029	0.19921	0.20037	0.09440	0.00017	0.09407	0.09473
Kisii	0.19391	0.00021	0.19350	0.19433	0.07870	0.00011	0.07848	0.07892
Kisumu	0.11115	0.00047	0.11022	0.11208	0.04271	0.00026	0.04218	0.04323
Siaya	0.15409	0.00038	0.15333	0.15486	0.06405	0.00022	0.06361	0.06448
WESTERN RURAL	0.17403	0.00018	0.17367	0.17438	0.07618	0.00010	0.07599	0.07638
Kakamega	0.15335	0.00026	0.15283	0.15387	0.06280	0.00015	0.06250	0.06311
Bungoma	0.19403	0.00043	0.19316	0.19489	0.09046	0.00026	0.08993	0.09098
Busia	0.24234	0.00057	0.24121	0.24348	0.11746	0.00032	0.11682	0.11810
TOTAL RURAL	0.14918	0.00007	0.14905	0.14931	0.06366	0.00004	0.06359	0.06374



measures and their corresponding one-sample t -statistics, at both the absolute poverty line and the absolute hard core poverty line defined as those whose total consumption expenditure is insufficient to meet the minimum food requirements. The purpose is to test whether the poverty measure is significantly greater than zero. The high values of the t -statistic imply that, for both rural 1982 and rural 1992 and at both poverty lines, the poverty measures $P_{\alpha=1,2}$ were significantly greater than zero for all regions.

15. Annex Table 4.8 shows that the rural 1982 provincial F-values and \cap^* for $P_{\alpha=1}$, for a distribution function censored at the absolute poverty line, $f(Y,z)=z$ for all $Y \geq z$, where $z = \text{Shs } 105.94$ monthly adult equivalent expenditure. Since the statistic \cap^* follows asymptotic normal distribution with zero mean and unit variance for large samples, the critical value of \cap^* for a double-sided test of difference between the provincial means of $P_{\alpha=1}$ at 5 per cent significance level is 1.960. The same critical value of \cap holds for $P_{\alpha=2}$ (Annex Table 4.9). As can be seen from Tables 8 and 9, the rural 1982 means of $P_{\alpha=1}$ and $P_{\alpha=2}$ were significantly different for all pairs of provinces at the absolute poverty line of Shs 105.94 monthly adult equivalent expenditure. However, the means of $P_{\alpha=2}$ for Nyanza and Western provinces may not be significantly different from each other under less stringent statistical comparison procedures.

16. At the absolute hard core poverty line of Shs 87.90 adult equivalent expenditure per month, the rural 1982 provincial means of $P_{\alpha=1}$ and $P_{\alpha=2}$ were significantly different for all pairs of provinces (Annex Tables 4.10 and 4.11). However, the $P_{\alpha=1}$ means for Nyanza and Western at the absolute hard core poverty line may not be significantly different under less stringent statistical comparison procedures.

17. As can be seen from Annex Tables 4.12 and 4.13, the comparison of rural 1992 $P_{\alpha=1}$ and $P_{\alpha=2}$ shows that the provincial means were significantly different at the absolute poverty line of Shs 484.98 adult equivalent expenditure, although the \cap^* statistic of $P_{\alpha=2}$ was comparatively nearer to region of acceptance for Coast-Eastern and Rift Valley-Western provincial pairs. Annex Tables 4.14 and 4.15 shows that, at the absolute hard core poverty line, the provincial means of $P_{\alpha=1,2}$ were significantly different although $P_{\alpha=1}$ was close to the region of acceptance for Rift Valley-Western pair, while $P_{\alpha=2}$ was close to the acceptance region for Coast-Eastern province pairs.

18. Tests of significance were conducted on the means of $P_{\alpha=1,2}$ using the 1981-82 Rural Household Budget Survey database by selected socio-economic groupings, namely, sex of household head, sex/marital status of household head, education of household head, and age of household head. As can be seen from Annex Tables 4.16 and 4.17, for all pairs of the above mentioned socio-economic groupings, the means of $P_{\alpha=1,2}$ were found to be significantly different, evaluated at the absolute poverty line of Shs 105.94 monthly adult equivalent expenditure.

19. Tests of significance of difference in the means of $P_{\alpha=1,2}$ were conducted on the rural 1992 Welfare Monitoring Survey database for selected socio-economic grouping schemes, i.e. by sex of household head, sex/marital status of household head, education of household head, and age of household head. The results reported in Annex Tables 4.18 and 4.19 show that, at the absolute poverty line of Shs 484.98 monthly adult equivalent expenditure, the differences in the means of $P_{\alpha=1,2}$ were significantly different for all pairs of socio-economic

grouping schemes selected for the analysis.

ESTIMATES OF SAMPLING ERROR

20. The results from sample surveys are affected by two types of errors: (a) the non-sampling error and (b) sampling error. Non sampling errors are due to mistakes in data collection, errors in asking questions and consequently the quality of data collected, and in data entry. The sampling error is a measure of variability between all possible samples that would have been selected from the same population.

21. The conventional algorithm for computation of standard error assume that the selection process of the national sample was random. The correct statistical procedure to compute the variance and standard errors of the estimates from the 1982 and 1992 databases would be to use a CLUSTERS program. However, the imprecision of using the conventional methodology in computing standard errors on a cluster sampling frame data is expected to be low when weighted variables are used.

22. Sampling errors will be presented for 1982 and 1992 poverty gap ratio (i.e. $P_{\alpha=1}$) and the severity of poverty index ($P_{\alpha=2}$). The results will be presented by district, province, and the whole country. For each variable, the statistics reported are mean, its standard error, and 95 per cent confidence interval. The confidence interval is obtained by going in both directions from the point estimate, adding or subtracting twice the standard error to the sample estimate. For example, the 1982 overall rural poverty gap ratio ($P_{\alpha=1}$) was 14.918 per cent and its standard error was 0.007 per cent. Therefore, there is 95 per cent probability that the true poverty gap ratio lies between 14.905 per cent and 14.931 per cent.

Annex Table 4.2: Testing for Significance of Differences in Provincial $P_{a=0}$, Rural 1982: t -statistics (Absolute poverty line, 105.94)

	Coast	Eastern	Central	Rift/V	Nyanza	Western
Coast	106.31					
Eastern	471.79	440.01				
Central	54.52	(66.32)	(505.81)			
Rift/V	(50.85)	(194.94)	(624.55)	(131.07)		
Nyanza	10.81	(106.12)	(505.30)	(48.01)	69.44	
Western	0.5455	0.4773	0.2569	0.5105	0.5788	0.5379
Mean $P_{a=0}$						

Annex Table 4.3: Testing for Significance of Differences in $P_{a=0}$ by Socio-Economic Groups, Rural 1982: t -statistics (Absolute poverty line, Shs 105.94)

Sex of Household Head

	Male	Female
Male	140.58	
Female	0.4931	0.4399
Mean $P_{a=0}$		

Sex/marital status of Household Head

	Male-Married	Male-Other	Female-Married	Female-Other
Male-married	144.60			
Male-other	166.53	(57.14)		
Female-married	58.51	(99.82)	(70.66)	
Female-other	0.4988	0.3675	0.4204	0.4670
Mean $P_{a=0}$				

Education status of Household Head

	None	Primary	Secondary
None	467.41		
Primary	566.86	345.18	
Secondary	0.5672	0.4104	0.1656
Mean $P_{a=0}$			

Age of Household Head

	≤ 25	26-30	31-40	41-49	Over 50
≤ 25	(14.08)				
26-30	(153.87)	(210.52)			
31-40	(275.95)	(390.65)	(222.22)		
41-49	(278.06)	(412.66)	(241.94)	14.26	
Over 50	0.3027	0.3150	0.4351	0.5432	0.5369
Mean $P_{a=0}$					

Annex Table 4.4: Testing for Significance of Differences in Provincial $P_{\alpha=0}$, Rural 1992: t -statistics
(Absolute poverty line, 484.98)

	Coast	Eastern	Central	Rift/V	Nyanza	Western
Coast						
Eastern	22.26					
Central	127.20	149.26				
Rift/V	(135.65)	(239.03)	(386.64)			
Nyanza	(64.68)	(127.08)	(271.63)	103.83		
Western	(181.25)	(286.58)	(420.43)	(77.62)	(166.00)	
Mean $P_{\alpha=0}$	0.4350	0.4216	0.3589	0.5151	0.4741	0.5481

Annex Table 4.5: Testing for Significance of Differences in $P_{\alpha=0}$ by Socio-Economic Groups, Rural 1992
(Absolute poverty line, 484.98)

Sex of Household Head

	Male	Female
Male		
Female	(92.28)	
Mean $P_{\alpha=0}$	0.4570	0.4842

Sex/marital status of Household Head

	Male- Married	Male- Other	Female Married	Female Other
Male-married				
Male-other	21.79			
Female-married	31.36	(4.08)		
Female-other	(176.01)	(112.82)	(163.42)	
Mean $P_{\alpha=0}$	0.4579	0.4431	0.4461	0.5291

Education status of Household Head

	None	Primary	Secondary
None			
Primary	323.05		
Secondary	725.47	531.12	
Mean $P_{\alpha=0}$	0.5742	0.4557	0.2668

Age of Household Head

	≤ 25	26-30	31-40	41-49	Over 50
≤ 25					
26-30	1.16				
31-40	(90.97)	(138.14)			
41-49	(157.06)	(234.72)	(139.70)		
Over 50	(204.41)	(314.98)	(257.67)	(93.80)	
Mean $P_{\alpha=0}$	0.3600	0.3591	0.4276	0.4789	0.5109

Annex Table 4.6: Poverty Measures and their *t*-statistics, Rural 1982

	Absolute Poverty Line (Shs 105.94)		Absolute Hard Core Poverty Line (Shs 87.90)	
	$P_{\alpha=1}$	<i>t</i> -statistic	$P_{\alpha=1}$	<i>t</i> -statistic
	Poverty Measure		Poverty Measure	
Coast	0.1859	798.15	0.1220	621.11
Eastern	0.1404	1,022.30	0.0853	767.47
Central	0.0674	573.71	0.0392	432.32
Rift Valley	0.1674	1,108.85	0.1096	868.74
Nyanza	0.1792	1,098.91	0.1142	830.14
Western	0.1740	903.11	0.1134	699.75
	$P_{\alpha=2}$		$P_{\alpha=2}$	
Coast	0.0816	613.10	0.0483	478.72
Eastern	0.0573	763.60	0.0321	581.33
Central	0.0267	434.14	0.0147	332.92
Rift Valley	0.0734	855.87	0.0437	685.07
Nyanza	0.0766	825.95	0.0448	651.32
Western	0.0762	693.74	0.0454	554.14

Annex Table 4.7: Poverty Measures and their *t*-statistics, Rural 1992

	Absolute Poverty Line (Shs 484.98)		Absolute Hard Core Poverty Line (Shs 404.66)	
	$P_{\alpha=1}$	<i>t</i> -statistic	$P_{\alpha=1}$	<i>t</i> -statistic
	Poverty Measure		Poverty Measure	
Coast	0.1538	632.46	0.1088	512.29
Eastern	0.1493	1,116.73	0.1048	893.63
Central	0.1209	960.61	0.0809	775.25
Rift Valley	0.2229	1,526.98	0.1740	1,299.51
Nyanza	0.1973	1,284.28	0.1514	1,109.23
Western	0.2297	1,267.96	0.1756	1,059.59
	$P_{\alpha=2}$		$P_{\alpha=2}$	
Coast	0.0763	482.23	0.0520	391.75
Eastern	0.0742	832.50	0.0509	667.73
Central	0.0543	740.15	0.0337	585.55
Rift Valley	0.1269	1,196.41	0.0953	1,008.30
Nyanza	0.1064	1,034.90	0.0764	879.60
Western	0.1257	975.76	0.0917	813.52

Annex Table 4.8: Testing for Significance of Differences in Provincial $P_{\alpha-1}$, Rural 1982
(Absolute poverty line, Shs 105.94)

	Coast	Eastern	Central	Rift/V	Nyanza	Western
Coast						
F-value						
χ^2 -value						
Eastern						
F-value	1.25					
χ^2 -value	176.02					
Central						
F-value	2.13	1.70				
χ^2 -value	506.33	393.02				
Rift/Valley						
F-value	1.04	1.21	2.05			
χ^2 -value	67.06	(132.55)	(504.18)			
Nyanza						
F-value	1.06	1.18	2.01	1.02		
χ^2 -value	23.97	(183.29)	(552.60)	(52.72)		
Western						
F-value	1.03	1.22	2.07	1.01	1.03	
χ^2 -value	39.39	(145.50)	(494.53)	(26.96)	20.36	
Mean $P_{\alpha-1}$	0.1859	0.1404	0.0674	0.1674	0.1792	0.1740

Annex Table 4.9: Testing for Significance of Differences in Provincial $P_{\alpha-2}$, Rural 1982
(Absolute poverty line, Shs 105.94)

	Coast	Eastern	Central	Rift/V	Nyanza	Western
Coast						
F-value						
χ^2 -value						
Eastern						
F-value	1.38					
χ^2 -value	169.23					
Central						
F-value	2.56	1.85				
χ^2 -value	426.57	306.11				
Rift/Valley						
F-value	1.06	1.30	2.41			
χ^2 -value	52.35	(141.91)	(425.25)			
Nyanza						
F-value	1.08	1.27	2.36	1.02		
χ^2 -value	31.45	(163.87)	(446.42)	(25.07)		
Western						
F-value	1.04	1.32	2.45	1.02	1.04	
χ^2 -value	31.72	(146.82)	(416.34)	(19.75)	2.92	
Mean $P_{\alpha-2}$	0.0816	0.0573	0.0267	0.0734	0.0766	0.0762

Annex Table 4.10: Testing for Significance of Differences in Provincial $P_{\alpha-1}$, Rural 1982
(Absolute hard core poverty line, Shs 87.90)

	Coast	Eastern	Central	Rift/V	Nyanza	Western
Coast						
F-value						
χ^2 -value						
Eastern						
F-value	1.35					
χ^2 -value	172.55					
Central						
F-value	2.54	1.88				
χ^2 -value	437.06	310.91				
Rift/Valley						
F-value	1.06	1.28	2.41			
χ^2 -value	53.54	(144.83)	(434.76)			
Nyanza						
F-value	1.05	1.28	2.41	1.00		
χ^2 -value	32.92	(164.89)	(451.59)	(24.25)		
Western						
F-value	1.03	1.31	2.47	1.03	1.02	
χ^2 -value	33.96	(147.32)	(422.41)	(18.19)	3.76	
Mean $P_{\alpha-1}$	0.1220	0.0853	0.0392	0.1096	0.1142	0.1134

Annex Table 4.11: Testing for Significance of Differences in Provincial $P_{\alpha-2}$, Rural 1982
(Absolute hard core poverty line, Shs 87.90)

	Coast	Eastern	Central	Rift/V	Nyanza	Western
Coast						
F-value						
χ^2 -value						
Eastern						
F-value	1.46					
χ^2 -value	151.76					
Central						
F-value	2.78	1.91				
χ^2 -value	350.69	236.89				
Rift/Valley						
F-value	1.09	1.34	2.56			
χ^2 -value	39.28	(137.52)	(355.07)			
Nyanza						
F-value	1.12	1.30	2.48	1.03		
χ^2 -value	29.27	(145.97)	(364.31)	(11.77)		
Western						
F-value	1.07	1.36	2.60	1.02	1.05	
χ^2 -value	22.74	(139.54)	(348.74)	(16.18)	(5.37)	
Mean $P_{\alpha-2}$	0.0483	0.0321	0.0147	0.0437	0.0448	0.0454