Structural adjustment, poverty and economic growth: An analysis for Kenya

By

Jane Kabubo-Mariara
and
Tabitha W. Kiriti
Department of Economics
University of Nairobi, Kenya

AERC Research Paper 124
African Economic Research Consortium, Nairobi
November 2002

Published by: The African Economic Research Consortium
P.O. Box 62882
Nairobi, Kenya

Printed by: Modern Lithographic (K) Ltd
P.O. Box 52810
Nairobi, Kenya

ISBN 9966-944-98-2

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Abstract

This paper analyses the impact of structural adjustment programmes on poverty and economic growth in Kenya. The results indicate that there was a decrease in poverty between 1992 and 1994 as shown by all poverty measures, while results from other studies show that poverty increased between 1994 and 1997. There was a remarkable improvement in macroeconomic policies between 1992 and 1994, while poverty declined, but a slight deterioration in macroeconomic policy between 1994 and 1997, which led to an increase in poverty. The study recommends that the institutional bottlenecks hindering economic reform should be addressed. Poverty alleviation policies should be pursued hand in hand with reforms so as to ensure equitable distribution of the long-term benefits of growth that may spring from economic reform, as well as special targeting of the poor who are found in the non-market sector and are therefore unlikely to benefit much from economic reform policies.

Acknowledgments

The authors are sincerely grateful to the African Economic Research Consortium (AERC) for financial support for carrying out this study. We also wish to thank resource persons and peers of the AERC biannual workshops for their valuable comments and input on various drafts of this paper. However, the authors remain solely responsible for the views and shortcomings of this study.

1. Introduction

Kenya experienced a relatively stable economic environment in the 1960s and early 1970s, with a GDP growth rate of 6.5% per annum between 1964 and 1971. The situation changed drastically, however, and the economy entered into a phase of macroeconomic instability, including stagnating incomes, declining consumption and increasing poverty. For example, the country experienced its first major balance of payments problems in 1971, when there was a drastic run down of reserves following an experiment in expansionary fiscal policies. This was followed by the oil crisis of 1973/74. The government reacted to these crises by tightening the trade regime and seeking external finances whose general policy conditionalities were spelt out in the 1974–1978 development plan and the 1975 Sessional Paper No. 4 on Economic Prospects and Policies. Thereafter the country opted for direct controls.

International Monetary Fund (IMF) programmes adopted in the early 1970s were abandoned when the country experienced an improvement in the balance of payments resulting from the 1976/77 coffee boom. The resulting expansion in aggregate demand coupled with the second oil crisis of 1979/80 produced a serious balance of payments crisis beginning in 1978, which the government sought to contain through a restrictive trade policy. The crisis again forced the country to seek loans from international financial institutions.

Other exogenous developments included droughts of 1979/80 and 1983/84 that negatively affected agricultural production and led to massive food imports, and the attempted military coup in 1982, which adversely affected investment and resulted in capital flight. The economy recovered in the late 1980s, however, recording an average growth rate of 5% between 1987 and 1989 compared with 0.9% in 1984. Further deterioration was realized in the early 1970s with poor performance in almost all the sectors of the economy.

In order to reverse the macroeconomic crises of the 1970s and early 1980s, it became necessary to adopt reform policies to reorient the economy and put it on a renewed growth path. In 1980, Kenya received the first loan from the IMF to finance structural changes in the industrial sector, promote efficient use of external resources and enhance the competitiveness of public investment. This was converted into a structural adjustment loan in the expectation that it would effect a quick response in exports. The response did not materialize and worsening economic conditions forced the government to return to the IMF in 1982 for a second adjustment loan to achieve similar objectives. Due to unsatisfactory implementation there was a pause in adjustment lending before adjustment on a sectoral basis commenced. During this period, there was abrupt macro/fiscal

stabilization and also a start towards flexible monetary and exchange rate policies. Trade liberalization also commenced but with little success because of the lack of coordination with macroeconomic policies.

The period 1986 to 1991 was one of adjustment, with various sectoral loans given as follows: agricultural sector (1990), industrial sector (1988), financial sector (1989) and export development (1990 and 1991). During this period, there was slow but steady progress in domestic price decontrol and trade liberalization, but a deterioration in fiscal discipline. Between 1991 and 1993, there was a weak reform effort and growing political problems, which led to suspension of balance of payments support. This resumed in mid 1993 and between 1993 and 1995; the government completely liberalized the foreign exchange market, ended import licences and completed domestic price decontrol. From 1996 to date, there has been a slow reform effort with reasonably well managed fiscal and monetary policy, but with structural adjustment problems in budgets, while the state enterprise sector, civil service and agricultural sector institutions have not been adequately dealt with (O'Brien and Ryan, 2001).

There are divergent views on the impact of reforms on poverty and growth. Critics have argued that economic reforms have contributed to even worse economic and social outcomes, only exacerbating the conditions that lead to poverty and vulnerability. Some argue that reforms are the key to promoting growth and reducing poverty, while others maintain that macroeconomic adjustment programmes have not been directly deleterious to the poor, but have not proved sufficient to generate sustainable economic growth and have thus failed to contribute in a large way to poverty alleviation (Sahn and Younger, 2001).

In Kenya, structural adjustment has failed to create the conditions for sustainable recovery of gross domestic product (GDP) growth to levels attained in the 1960s and 1970s. With this slow growth, poverty has been increasing while social indicators (life expectancy, child mortality and primary school enrolment) have shown negative trends in the adjustment period. Public sector reforms aim at reducing aggregate demand and increasing aggregate supply through reduction of the government fiscal budget. The effect of education and health sector reforms has been a decline in household savings and an increase in poverty since a larger proportion of the consumers' income is devoted to education and health care financing.

Studies on poverty in Kenya have concentrated on measurement, profiles and determinants. The issue of economic reform policies and welfare are not well understood and there is a dearth of empirical literature in Kenya. While some studies have attempted to link structural adjustment policies and welfare indicators (Ayako and Odada, 1988; Bigsten and Ndung'u, 1992; Mwega and Kabubo, 1993), to date no empirical study has been carried out to determine/assess these links. This study contributes to the literature by investigating the impact of economic reforms on poverty and economic growth. The study uses evidence from the 1992, 1994 and 1997 Welfare Monitoring Surveys to assess the impact of macroeconomic policy changes on poverty. The paper addresses the following questions:

- What has been the nature and extent of poverty and inequality during structural adjustment?
- What is the relationship between poverty and growth in Kenya?
- What is the link between macroeconomic adjustment policies and poverty?

The rest of the paper is organized as follows: Section 2 reviews macroeconomic reform policies in Kenya, Section 3 presents the theoretical framework and methodology, and Section 4 discusses the empirical implementation. Section 5 contains the summary and conclusions.

2. Macroeconomic reform policies in Kenya

The basic objectives of structural adjustment programmes were to restore developing countries to macroeconomic stability and to revive economic growth through increased resource mobilization and more efficient use of resources. Efficiency gains would be achieved through greater reliance on market forces and the private sector and by reducing the role of the government. This meant getting prices right by eliminating market distortions and increasing competition in the domestic economy. The latter was to be achieved through deregulation, phasing out public sector monopoly control in markets for foreign exchange, credit, and agricultural commodities, and privatization (O'Brien and Ryan, 2001).

Throughout the reform period, the policy framework has emphasized macroeconomic stabilization through monetary, fiscal and exchange rate management, although the policy agenda has also encompassed interest rate deregulation; domestic price decontrols; cereals market liberalization; and decontrol of markets for agricultural inputs and other agricultural outputs such as meat, dairy products, cotton and sugar. Other features of the reform period have been export incentive schemes, reform of financial management and regulatory reforms, family planning, and financing for reforms in the health and education sectors.

However, exchange rate and monetary policy are the most important tools in economic management and in the stabilization and adjustment policies in developing countries. In most developing countries low inflation and international competitiveness have become major targets. The real exchange rate is a measure of international competitiveness, while inflation mostly emanates from monetary expansion, currency devaluations and other structural factors (Levin and Ndung'u, 1994). On the other hand, fiscal adjustments are often geared towards poverty alleviation and equality in income distribution. We examine each of the policies below. (Refer to Appendix A for tables of macroeconomic indicators.)

Exchange rate policies

The exchange rate policy in Kenya has undergone various regime shifts over the years. The thrust of the policy has been to maintain economic stability, a competitive exchange rate and low inflation. Up to 1974, the exchange rate was pegged to the dollar. Between 1974 and 1981 the movement in the nominal exchange rate was quite erratic, depreciating by about 14% but accelerating in 1981/82. Between 1980 and 1982, the Kenya shilling was devalued by about 20% in real terms, measured against the SDR.

Thereafter (end of 1982), the exchange rate regime was changed to a crawling peg in real terms.

This regime continued up to the end of 1989. In 1990, the exchange rate was floated partially and a dual exchange rate system was adopted. During this period there was accelerated money supply and high inflation, but at the same time there was a move to speed up economic reforms and accelerate the pace of liberalization in line with donor conditionalities. Macro policies had become severely unstable, especially the exchange rate and domestic prices, which were then followed by the treasury bill discount rate. In early 1991 the Kenya shilling exchange rate was adjusted several times in order to maintain external competitiveness against the currencies of major trading partners. In October 1993, the official exchange rate was abolished and the official and inter-bank foreign exchange rates merged.

From this period, the official exchange rate was set by the central bank at the previous day's average market rate, which was a complete float of the currency. Depreciation in 1993 during the partial float largely reflected excessive expansion of the money supply and the tremendous increase in the rate of inflation, loose fiscal policies in 1992, and the move towards liberalization in the goods and foreign exchange markets. In March 1993, instability in macro prices was so severe because of excess liquidity that no financial liberalization measures could continue without first establishing some basic stability.

Since the complete float, the exchange rate to the dollar has oscillated, with the currency appreciating steadily since mid May 1994. The general stability of macro prices and the credibility and confidence that had started building up indicated that economic reforms had started showing fruit. The shilling depreciated slightly between April and July 1995, however, before gaining stability at approximately Ksh55 to the US dollar towards the end of 1995.

It is noted that in spite of the instability in the exchange rate, Kenya's exchange rate policy has been an effective policy instrument and the most successful component of the structural adjustment policies in the 1990s. It has been used as a measure to improve Kenya's international competitiveness and to bring about a reduced level of aggregate expenditures (Levin and Ndung'u, 1996).

Monetary policy

Monetary policy was rigid and passive in the 1960s and 1970s. Interest rates were fixed and the primary function of the Central Bank of Kenya was to accommodate deficit-financing requirements through the sale of treasury bills. In the 1970s, the minimum rate on savings was gradually increased from 3% in 1974 to 10% in 1981/82. Regulated maximum lending rates were allowed to rise from 10% to 16%, but were also negative in real terms in most years. In the 1980s, a more flexible and market-based interest rate policy was adopted, with more frequent adjustments in savings and lending rates to reflect inflation. By 1990, the minimum rate on savings had been raised to 12.5% and the maximum lending rate to 19%, but with banks permitted to charge additional fees. Treasury bill rates were allowed to float from November 1990, and in 1991 all interest rates were

fully deregulated. In the late 1980s and early 1990s, monetary policy deteriorated remarkably. The quality and effectiveness of bank supervision declined, adherence to prudential regulations was lax;,a number of small banks failed, and growth in money supply began to outpace demand (O'Brien and Ryan, 2001).

Although the main thrust of monetary policy in Kenya has been to contain liquidity expansion at a pace consistent with targeted growth of GDP, controlling inflation and maintaining positive real interest rates, money supply growth has been very erratic (Ndung'u, 1996). The most spectacular period was 1976–1978 during the commodity boom. During this period, the government allowed foreign exchange reserves and public expenditures to rise simultaneously, which fed quickly into the growth of money supply. When foreign exchange reserves fell, money supply continued to grow in line with the widening fiscal deficit. Inflationary expectations went up in the early 1990s as a result of the freezing of quick disbursement aid and excess liquidity due to multi-party elections. Further, the treasury discount rate (TDR) and the bond yield rose sharply in mid 1993, followed by interest rates on loans and advances. These factors led to stiff increases in the rate of inflation, which shot up to 100% in June 1993. To curb inflation, the government resorted to open market operations with treasury bills attracting interest rates of over 70% and the yield rate of bonds rising to about 85% in the same period. For long-term measures, a progressive reserve ratio of commercial banks was set, increasing from 12% in 1992 to 20% in March 1994. At the same time, the monetary stance was supported by strict enforcement of limits to access to CBK credit through its rediscount and overnight lending facilities. By late 1993, the financial crisis was contained and treasury bill rates had declined to the 20–30% range, where they remained for a long period before falling further to a range of 7–15% in 1999.

Fiscal policy

Fiscal reform is considered to be the cornerstone of the sustainability of the macroeconomic reform process, yet it is the most fragile component in Kenya (Levin and Ndung'u, 1996). The overall budget deficit has been quite erratic from year to year but total expenditures have consistently exceeded revenues. The budget deficit as a ratio to GDP was less than 3% by the early 1970s. The gap widened as a result of increases in government expenditure in education, agriculture, health, defence and energy. By 1981 the budget deficit was 7% of GDP. A strong stabilization programme adopted between 1982 and 1984 succeeded in sharply reducing the deficit. However, despite the introduction of budget rationalization in 1985, aimed at cutting government expenditure, by 1990 the fiscal deficit was as high as in 1981. This was mainly attributed to a significant proportion of government budget spent during the 1992 multi-party elections, the public management of the famine drought relief effort, and the administrative and security cost of managing the influx of refugees fleeing from the civil wars in some of the neighbouring countries.

This deficit was financed through borrowing from the domestic non-bank sector (equivalent to 5% of GDP), and external financing (2.2% of GDP) (Appendix A, Table A3). The financing of the deficit, however, was inflationary in nature with the increased

money supply. There have been continued efforts to broaden the tax base and increase efficiency while at the same time cutting down on government expenditure in collection of taxes. The value added tax was also widened to cover a range of consumer products with effect from September 1994. The immediate reaction was to raise prices by the amount of the VAT, which in turn affected inflation.

Servicing of the public debt continues to swallow an increasing share of government expenditure, with half of this expenditure going to interest and amortization of debt. The domestic interest bill is estimated at 10% of GDP, or 40% of government revenue. The increasing debt burden has caused expenditures in other areas to decline and this is most notable in the service sector (education and health). Public consumption and fixed capital formation have declined, contributing to a fall in gross investment.

The mode of financing the budget changed with increased reliance on domestic borrowing following the aid embargo in 1991/92. In 1993/94, government bonds and short-term treasury bills were used to finance the deficit and increased more than tenfold on a net basis. Since then, there has been a net outflow in both long-term and short-term domestic borrowing, which reflects government policy of reduced domestic borrowing.

3. Theoretical framework and methodology

A few studies have attempted to empirically test the impact of structural adjustment on poverty in developing countries (Kakwani, 1990; Ravallion and Huppi, 1991; Ali, 1992). These studies have used the approach developed by Kanbur (1987), who argued that the distribution effects of an adjustment programme can best be analysed by means of a fully specified model that takes into account all of the general equilibrium feedbacks of the programme. Due to limitations of data in developing countries, however, he presented a methodology whereby the impact of an adjustment programme on poverty could be quantified using existing household income and expenditure survey information.

From existing literature, Kanbur identified two approaches to the analysis of adjustment and poverty: One, a qualitative approach, follows through the effects of relative price changes on relative factor rewards, using the Stolper–Samuelson theorem. An alternative approach uses an explicit model of the entire economy following through in detail the repercussions of a given policy change. Kanbur considered neither of these methods appropriate because of calibration assumptions. He therefore took an intermediate tack, which uses the first qualitative approach to provide key sectoral divisions but moves in the direction of the more quantitative approach by developing a methodology that can be applied using existing household data. His method requires the measurement of poverty followed by a test of the effect of expenditure reduction on poverty, using additive or multiplicative models.

Kakwani (1990) used the methodology developed by Kanbur to model the link among poverty, economic growth and adjustment policies in Côte d'Ivoire. He used the Lorenz curve to analyse inequality in the size distribution of income. The Lorenz curve was presented as $L(p)$ = the fraction of total income received by the bottom $P \times 100\%$ of the population. Kakwani argued that the Lorenz curve is independent of the size of the mean income, but any shift in the curve will change the inequality.

Assuming that the Lorenz function has K parameters, $m_1, m_2 \ldots mk$, then shifts in the Lorenz curve will occur as result of changes in these parameters:

$$dL(p) = \sum \frac{\delta L(p)}{\delta Lmi} \delta mi \qquad (1)$$

Assuming that the poverty index (θ) is a function of the poverty line income (z), the threshold income below which one is considered to be poor, the size of the mean income (μ) and income inequality m, then inequality can be measured by a single inequality

index, but more generally it should be represented by the parameters of the Lorenz curve. Holding the poverty line constant, Kakwani wrote:

$$\delta\theta = \frac{\delta\theta}{\delta\mu}\delta\mu + \sum \frac{\delta\theta}{\delta mi} mi \tag{2}$$

which allows us to decompose changes in poverty into two components (a) the impact of growth on poverty when the distribution of income doesn't change; and (b) the effect of income redistribution when the total income of the society remains unchanged. This approach makes it possible to compute these components using one time period data.

Kakwani developed a general expression for deriving the elasticity of the entire class of additively separable poverty measures, θ, with respect to μ as:

$$\eta_\theta \frac{1}{\theta}\int_o^x \frac{\delta p}{\delta x}\int (x)dx \tag{3}$$

Using this general expression, he considered the Foster, Greer and Thorbecke (FGT, 1984) class of poverty measures:

$$P_a = \int_o^x \frac{(z-x)^\alpha}{z}\int (x)dx \tag{4}$$

and obtained the elasticity of P_a with respect to mean income and inequality component as

$$\eta_o = \frac{\delta Pa}{\delta\mu}\frac{\mu}{Pa}(P_{a-1} - P_a)/Pa \tag{5}$$

$$\varepsilon_\theta = \eta_\theta + a(\frac{\mu}{z})P_{a-1}/P(a) \tag{6}$$

for a = 0

where η_θ is the elasticity of the poverty measure θ for the mean income μ, assuming that income inequality remains constant, and ε_θ is the elasticity of the poverty index for the Gini index.

To measure the trade-off between mean income and inequality (given that both affect poverty) the proportionate change in poverty can be decomposed as

$$\frac{(d\theta)}{\theta} = \eta_\theta \frac{d\mu}{\mu} + \varepsilon_\theta \frac{dG}{G} \tag{7}$$

where the first term relates the effect of mean income on poverty and the second term measures the effect of change in the Gini index. Equating $d\theta/\theta$ to zero, we obtain the marginal proportional rate of substitution (MPRS) between mean income and inequality, (Kakwani, 1990), which can be computed for each poverty measure.

$$MPRS = \frac{\partial \mu}{\partial G}\frac{G}{\mu} = -\frac{\varepsilon_\theta}{\eta_o} \tag{8}$$

Kakwani estimated the quantitative measurement of the effect of adjustment policies on poverty from Equation 8 by measuring the growth rate in the various sectors during the adjustment period using the following equation:

$$\frac{d\theta}{\theta} = \sum \eta_{\theta i} \frac{d\mu_i}{\mu_i} + \sum \varepsilon_{\theta i} \frac{dG_i}{G_i} \tag{9}$$

where μ_i is the growth rate in sector *i* and G_i is the Gini index of the i^{th} subgroup. The first term measures the proportionate change in total poverty assuming that inequality within various sectors' growth remains constant. If the sectoral rates differ, then,

$$\sum \eta_{\theta i} \frac{d\mu_i}{\mu_i} = \eta_\theta \frac{d\mu}{\mu} - \sum \eta_{\theta i} [\frac{d\mu d\mu_i}{\mu \mu_i}] \tag{10}$$

The first term is the pure growth effect on poverty and the second term measures the effect of a change in the between-sector inequality as a result of different growth rates in various sectors and this captures the effect of adjustment policies on total poverty.

Ali (1992), however, notes that Kakwani's assumption of a constant poverty line is arbitrary and that this is particularly critical for the purpose of analysing the effects of structural policies on poverty. Assuming that the poverty line changes over time, then Equation 7 becomes:

$$\frac{d\theta}{\theta} = (\frac{d\theta}{dz}\frac{Z}{\theta})\frac{dz}{z} + \eta_\theta \frac{d\mu}{\mu} + \varepsilon_\theta \frac{dG}{G} \tag{11}$$

where the first expression on the right-hand side captures the elasticity of the poverty index with respect to the poverty line and the change in poverty becomes:

$$\frac{d\theta}{\theta} = \eta_\theta[\frac{d\mu_i}{\mu_i} - \frac{dz}{Z}] + \varepsilon_\theta \frac{dG}{G} \tag{12}$$

Equation 12 provides a much richer structure for the analysis of the impact of adjustment programmes on poverty. The first part on the right-hand side captures a dynamic version of entitlement while the second part captures the distribution aspect of the change in poverty.

Ali (1992) further argues that recalling the World Bank definition of poverty as being the inability to attain a minimum standard of living and housing, the change in average income in Equation 11 could be taken to represent the change in entitlement and the comparison with the poverty line could be taken to represent the extent to which entitlements have been enhanced or undermined as a result of structural policies.

Following Sen's (1976) entitlement approach, Ali (1992) showed that if average income is taken as representing entitlement, then the most important determinants of entitlement are the vector of prices ruling in the economy and the government fiscal operations dealing with the transfer of incomes among the population. These can be considered as the most important mechanisms through which adjustments affect the poor.

Our study adopts the direct approach developed by Kakwani and modified by Ali to link adjustment policies to poverty and growth as well as to test for the appropriate target by decomposable group. This requires estimation of the FGT class of decomposable poverty indexes using Equation 4 and then using these indexes in Equation 7 to decompose the total change in poverty, where the first term in parentheses measures the pure growth effect on poverty (see Kakwani, 1990; Ali, 1995; Ravallion and Datt, 1995, 1996), and the last term on the right-hand side captures the redistribution component of changes in poverty.

4. Empirical implementation

World Bank (1990) and Ravallion (1994) define poverty as the inability to attain a minimal standard of living and housing. Ravallion (1994) further argues that there exist pre-determined and well-defined standards (levels) of consumption (poverty lines) that must be reached if a person is not to be deemed "poor". Sen (1976) defines poverty as the lack of certain capabilities, such as being able to participate with dignity in society. The capabilities are absolute, but the commodities needed are relative.

On the other hand, food poverty has been defined as a condition of lacking the resources to acquire a nutritionally adequate diet. A household is defined as food poor if it is unable to provide its members with the recommended daily allowance (RDA) of calories. A food poverty line is the minimum food expenditure required to meet calorie needs while eating a diet typical of households that consume exactly the calorie RDA (Greer and Thorbecke, 1986b; Ravallion and Bidani, 1994).

Estimating poverty lines

There are two main ways of deriving poverty lines: absolute and relative poverty lines. The most common approach in defining an absolute poverty line is to estimate the cost of a bundle of goods deemed to assure that basic consumption needs are met in the specific domain of the poverty comparison. For developing countries, the most important component of a basic needs poverty line is generally the food expenditure necessary to attain some recommended food energy intake. Added to this cost of food is a modest allowance for non-food items thought to be crucial for living in a social context "without feeling shame" (Ravallion 1994; Ali, 1995).

Relative poverty, on the other hand, has been more important in assessing poverty in developed countries. A relative poverty line is set at a constant proportion of the mean income. Such a definition of poverty explicitly allows 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.

Following the notion of an absolute poverty line for developing countries, two approaches are generally used to construct poverty lines: the food energy intake (FEI) approach and the cost of basic needs (CBN) approach.

The food-energy intake (FEI) method

This method proceeds by finding the consumption expenditure or income level at which a person's typical food energy intake is just sufficient to meet predetermined food energy requirements. This method aims to find a monetary value for the poverty line at which basic needs are met. A common practice is simply to calculate the mean income or expenditure of a subsample of households whose estimated calorie intakes are approximately equal to the stipulated requirements. This approach is considered computationally easy but requires household level data.

The cost of basic needs (CBN) approach

In this approach the poverty line is set as the cost in each sector and at each date of a normative "basic needs" bundle of goods. A bundle of goods in each region is taken as the average consumption of the poor. The bundle is typically chosen to be sufficient to reach the predetermined calorie requirements, with a composition that is consistent with the consumption behaviour of the poor (Ravallion and Sen, 1996). Poverty is then measured by comparing actual expenditures with the CBN. A person who consumes less food (say) than the stipulated basic needs is not considered poor if the person's budget allocation could be rearranged to cover the basic needs (Ravallion and Bidani, 1994). A non-food component is added to this poverty line by dividing the food component by some estimate of the budget share devoted to food (Ravallion, 1998).

Because of the non-availability of household level data, this study used the CBN approach to determine poverty lines. Food poverty lines were derived following the Central Bureau of Statistics (Republic of Kenya, 1996) approach, while the overall poverty lines were derived using the Ravallion (1998) approach.

Poverty lines

The results of the poverty line estimates are presented in Table 1 and Appendix B. The regional food poverty lines for 1992 vary from Ksh420 to Ksh617 per adult equivalent per month. The results further indicate that Coast province reported the lowest poverty line followed by Nyanza province, while the highest poverty line was for Nairobi. The results compare closely with Mukui (1994), who found the lowest food poverty line to be for Nyanza province and the highest for Nairobi, and Greer and Thorbecke (1986a), who found Nyanza to have the lowest and Central the highest poverty lines. Our results for 1994 are consistent with those of 1992 in terms of the highest and lowest poverty lines, with the poverty line ranging from Ksh597 to Ksh880.

The variability in food poverty lines reflects differences in prices, food preferences and inter-regional variations in consumption levels. For example, Nairobi shows higher preference for vegetables, dairy and fruits, while Coast and Nyanza provinces show high consumptions of maize. Such differences cause problems in comparing poverty rates

across regions because preferences rather than command over goods affect a household's poverty status. The differences can be eliminated by fixing a poverty line over space assuming that all regions consume each item in a food basket in the same quantities and that regions have a common preference (Mwabu et al., 1999). The composition of the diet therefore varies considerably from one region to another. The overall food poverty line per adult equivalent increased from Ksh495 in 1992 to Ksh703 in 1994. Given that there is no variation in diet composition, this change could be attributed to changes in prices.

Table 1: Poverty line per adult equivalent by province, Kshs/month/year

Poverty line	Food poverty				Overall poverty		
Province/Year	1992[a]	1994[a]	1977[b]	1994[c]	1992[a]	1994[a]	1994[c]
Nairobi	616.81	879.72	N/A	809	1,101.45	1,571.0[b]	1,348
Coast	419.79	597.21	395	774	749.63	1,066.45	1,025
Eastern	519.42	632.72	306.5	594	927.54	1,129.86	819
Central	481.55	686.75	350.7	676	859.91	1,226.34	941
Rift Valley	465.06	665.95	256.9	600	830.46	1,189.20	866
Nyanza	430.14	609.66	257.6	593	768.11	1,088.68	800
Western	454.65	648.86	283.3	591	811.88	1,158.68	751
National average	495.33	702.99	N/A	625	884.52	1,255.34	870

Source: [a]Authors' calculations; [b]Greer and Thorbecke (1986a); [c] Mwabu et al. 1999;
[d] Food share = 0.56 (African Development Indicators, 1997; Ravallion 1998)

The overall poverty lines for 1992 varied from Ksh750 to Ksh1,101, while for 1994 they varied from Ksh1,066 to Ksh1,571 per adult equivalent. The lowest poverty line was observed for the Coast and the highest was for Nairobi for the two years. On average, the overall poverty line increased from Ksh885 to Ksh1,255 per adult equivalent per month. Again we note that our estimated overall poverty line for Nairobi (Ksh1,101.45) compares very closely with the overall urban poverty line of Ksh1,153 obtained by Mukui (1994).

Measuring poverty

There has been a degree of controversy over how the information on poverty lines and the distribution of consumption expenditures should be aggregated in the form of a poverty measure. A poverty measure is a summary statistic calculated from the shortfalls indicating the severity of poverty within the population. A poverty measure must satisfy two very important axioms. These are, first, the monotonicity axiom, which states that other things being equal, a reduction in the income of any poor individual must increase the poverty measure.This axiom ensures that the poverty measure is responsive to the severity of poverty of each individual. Second is the transfer axiom, i.e., given other things being equal, a pure transfer of income from a poor individual to

any other individual who is richer must increase the poverty measure. This axiom captures the concept of relative deprivation, which requires that a poverty measure be most sensitive to the well-being of the poorest of the poor. To satisfy the transfer axiom, it is necessary to weight the shortfalls so that the deprivation of the poorest is counted more heavily than that of the less poor. These criteria imply that one wishes the measure to take account of the distribution of living standards among the poor, not simply to indicate how many people are poor.

It is also desirable that the poverty measure be additively decomposable by population subgroup so that aggregate poverty can be represented as an appropriately weighted sum of poverty levels in the component subgroups of a population. This property facilitates the construction of poverty profiles and ensures that when poverty increases in one subgroup without any other changes, aggregate poverty will also increase.

The commonly used poverty measures that satisfy these assumptions (Sen, 1976) capture three aspects of poverty: its incidence, its depth and its severity. These are all members of the class of measures proposed by Foster, Greer and Thorbecke (FGT, 1984) and include: The head-count index (H); given by the percentage of the population living in households with a consumption per capita (Y) that is less than the poverty line (z). This can be interpreted as a measure of the "incidence" of poverty. It is easily understood but tells nothing about the depth or severity of poverty. The poverty-gap index (PG), which is based on the aggregate poverty deficit of the poor relative to the poverty line. PG gives a good indication of the depth of poverty, but it is unaffected by changes in inequality among the poor and thus may not capture differences in the severity of poverty (Ravallion and Sen, 1996, Ravallion 1994): and three, the squared poverty-gap index ($FGTP_2$ measure), which is defined as the mean of the squared proportionate poverty gaps. The poverty gaps are weighted in aggregation, with greater weight given to larger gaps, and where the weights are simply the poverty gaps themselves.This allows the index to reflect changes in the "severity" of poverty in that it will be sensitive to inequality among the poor.

All three measures are functions of both the mean consumption (Y_i) of each subgroup normalized by the poverty line (z) and the Lorenz curve for the distribution of consumption. The three measures suggest a generic class of additive measures:

$$P_\alpha = \frac{1}{n}\sum\left[\frac{Z - Y_i}{Z}\right]^\alpha$$

for some non-negative parameter α. The measures are special cases, for the head-count index α=0, while α=1 for PG and α=2 for FGT(P_2).[1]

Poverty measures

Table 2 presents poverty measures and the total change in poverty between 1992 and 1994. Column two indicates that Western and Eastern provinces reported the highest

incidence of poverty, while Central and Nairobi provinces reported the lowest incidence in 1992 and 1994, respectively. The poverty-gap ratio ranged from 38.36 to 16.74, in 1992 compared with a range of 26.87 to16.78 in 1994. The results imply that the income gap (inequality) of those in absolute poverty was about 34% (24%) of the poverty line in 1992 (1994). Therefore, the proportional income shortfall of the poor was about 34% (24%) larger than the income shortfall of the people at the poverty line in the two years. The last three columns present the severity of poverty in the two years. The results indicate that poverty was more severe in 1992 than in 1994. Furthermore, in 1992, absolute poverty was more severe in Western province than in any other region, while in 1994, the same case applied for Eastern province.

Table 2: Poverty measures and total change in poverty: 1992-1994 (%, ΔX % points)

Region/ Year	Head-count ratio : H			Poverty-gap			ratio : P	FGT2 : SQP	
	1992	1994	ΔH	1992	1994	ΔP	1992	1994	ΔSQP
Nairobi	-	43.30	-		16.78	-	-	8.53	-
Coast	64.14	49.45	-14.69	26.59	19.97	-6.62	13.87	10.21	-3.66
Eastern	76.43	61.68	-14.75	36.85	29.08	-7.77	21.40	16.69	-4.71
Central	61.69	54.69	-7.00	26.74	21.85	-4.89	14.36	11.15	-3.21
Rift Valley	68.37	52.03	-16.34	33.66	21.55	-12.11	19.74	11.27	-8.47
Nyanza	71.91	58.44	-13.47	35.08	26.21	-8.87	20.49	14.46	-6.03
Western	76.75	59.68	-17.07	38.36	26.87	-11.49	22.65	14.92	-7.73
National average	70.42	54.45	-15.97	33.87	23.92	-9.95	19.64	13.17	-6.47

Source: Authors' calculations.

Other than for Nairobi, whose poverty measures could not be estimated due to lack of data, the results indicate that poverty declined in all regions as shown by all poverty measures. On average, the incidence of poverty, as measured by the head-count ratio, declined by 16 percentage points, the depth of poverty as measured by the poverty gap ratio declined by 10 percentage points; and the severity of poverty as measured by the squared poverty-gap ratio declined by 6 percentage points. Western province seems to have been the poorest province as indicated by all measures of welfare, followed by Eastern province and Nyanza. These results are consistent with findings by Mwabu et al. (1999) who found that in 1994, Eastern and North Eastern provinces were the poorest regions followed by Western province. Although the poverty measures seem unreasonably high for 1992, we note that they compare closely with results obtained by the Central Bureau of Statistics (Economic Survey, 1997) where the head count for rural areas was 72%, with the regional head count ranging from a high of 82% in Rift Valley to a low of 62% in Eastern province. The poor quality of the 1992 survey data set could be the reason why the results for this year seem so different from other years. Our results also support previous findings, which indicate that Central and Nairobi provinces have maintained the lowest incidence of poverty since 1982.

The elasticities of the poverty measures are presented in Table 3. The results indicate that for all provinces, the head-count ratio was more sensitive to changes in mean income

than to the distributional component. The same applies to the poverty-gap ratio except for Nairobi and Coast provinces for 1994. On the other hand, the $FGTP_2$ index was more sensitive to changes in the distribution component than to changes in mean income. These results support earlier studies on the behaviour of poverty in developing countries (Ali, 1992; Chen, et al., 1993).

Table 3: Growth (η) and distribution (ε) elasticities of poverty measures: 1992–1994*

Region		η (H)	ε (H)	η (Pi)	ε (Pi)	η (FGT_2)	ε (FGT_2)
Nairobi	92	n/a	n/a	n/a	n/a	n/a	n/a
	94	-1.18	0.35	-1.58	1.77	-1.93	3.18
Coast	92	-0.85	0.02	-1.41	1.05	-1.83	2.08
	94	-0.98	0.20	-1.48	1.50	-1.91	2.79
Eastern	92	-0.55	-0.11	-1.07	0.58	-1.44	1.31
	94	-0.72	-0.03	-1.15	0.90	-1.50	1.84
Central	92	-0.78	0.05	-1.31	1.14	-1.72	2.23
	94	-1.00	0.08	-1.50	1.19	-1.92	2.29
Rift	92	-0.55	-0.02	-1.03	0.94	-1.41	1.90
Valley	94	-0.94	0.13	-1.41	1.34	-1.82	2.54
Nyanza	92	-0.56	-0.06	-1.05	0.78	-1.42	1.63
	94	-0.76	0.03	-1.23	1.08	-1.63	2.14
Western	92	-0.49	-010	-1.00	0.59	-1.39	1.31
	94	-0.77	0.01	-1.22	1.02	-1.60	2.04
National	92	-0.59	-0.05	-1.08	0.81	-1.45	1.69
average	94	-0.86	0.07	-1.28	1.18	-1.63	2.29

*Based on the general quadratic Lorenz curve.
Source: Authors' calculations.

Growth and distribution components

Table 4 presents results on growth and inequality for all the provinces. The highest change in mean income was observed for Western province (81%) while the lowest was for Central province (44%). On average there was a 69% increase in mean income. It is apparent that there was more inequality in income distribution in Rift Valley province in 1992 than in any other region, as indicated by the Gini index. The situation changed in 1994, with Eastern taking the lead and Central recording the lowest Gini index. Except for Eastern province there was an improvement in income distribution, with Rift Valley leading with 9.23 percentage points. On average the distribution improved by 6.2 percentage points.

Table 4: Change in growth and inequality: 1992-1994

Region/ Year	Gini coefficient (GC)			Mean income (M) Kshs		
	1992	1994	ΔGC	1992	1994	ΔM %
Nairobi	-	33.31	-	-	2,040	-
Coast	37.75	34.35	-3.40	765	1,282	0.68
Eastern	36.68	36.68	-0.00	741	1,077	0.45
Central	39.10	32.79	-6.31	913	1,318	0.44
Rift Valley	43.57	34.34	-9.23	805	1,356	0.68
Nyanza	40.29	36.37	-3.92	685	1,130	0.65
Western	40.13	36.24	-3.89	647	1,171	0.81
National average	41.23	35.07	-6.16	805	1,357	0.69

Source: Authors calculations.

Poverty over time and space

In Table 5, we compare poverty measures from other sources between 1992 and 1997. The results indicate that 45% of all Kenyans were poor in 1992, with Western province recording the highest level of poverty. In 1994, two different sets of results are presented: Mwabu et al. (1999) show that 39% of all Kenyans were poor in 1994, compared with the government estimate of 40%. The two sets of results rank Eastern province as having the highest incidence of poverty, while Nairobi and Central reported the lowest incidence. In 1997, the incidence of poverty rose to 52%, with Nyanza recording the highest incidence (63%) and Central the lowest. It is amazing to note that the incidence of poverty in Nairobi doubled between 1994 and 1997. Though there were many economic setbacks, such a large change in poverty does not seem realistic in only three years. Judging from the government results, the largest fluctuation in the incidence of poverty during this period was observed for Coast province, while Central province recorded the lowest fluctuation. The fall in the incidence of poverty could be attributed to the prevailing weather conditions several months prior to the survey, an increase in inflation and a shortfall in agricultural output caused by widespread drought in late 1996 and early 1997.

Consistent with our findings in Table 2, the poverty-gap ratio indicates that the depth of poverty fell across all regions between 1992 and 1994, with the largest decline being observed in urban areas. Nairobi recorded the lowest depth, while Western recorded the highest depth in 1992. Eastern province recorded the highest depth in 1994, but in 1997 the Coast province led. The results of the severity of poverty are consistent with those of the poverty-gap ratio.

Table 5: Other estimated poverty measures: 1992-1997

Region / Year	Head-count ratio (H)				Poverty - gap ratio (P)				FGT2 (SQP)			
	1992	1994*	1994	1997	1992	1994*	1994	1997	1992	1994*	1994	1997
Nairobi	26.45	26.63	25.90	50.24	7.68	7.23	8.80	14.07	3.42	2.97	4.14	5.47
Coast	43.50	41.36	55.63	62.10	15.38	15.16	23.79	24.40	7.63	7.51	13.1	11.87
Eastern	42.16	44.96	57.75	58.56	14.93	16.09	24.29	22.37	7.42	7.64	13.49	10.71
Central	35.89	31.79	31.93	31.39	12.09	9.01	9.78	9.25	5.43	3.72	4.38	3.94
R. Valley	51.51	38.31	42.87	50.10	22.29	13.03	16.35	17.58	12.69	6.1	8.46	8.17
Nyanza	47.41	37.65	42.21	63.05	19.73	11.29	14.39	23.43	10.64	4.91	7.06	11.43
Western	54.81	40.58	53.83	58.75	22.97	13.94	22.05	22.81	12.57	6.56	12.11	11.16
Rural	46.33	37.75	39.70	52.93	18.37	13.04	18.01	19.33	9.75	5.96	9.49	9.91
Urban	29.29	28.63	28.95	49.20	8.92	8.62	9.69	15.67	3.94	3.80	4.63	6.68
National average	44.78	38.80	40.25	52.32	17.51	13.04	14.93	18.74	9.22	6.05	9.49	8.81

Source: Republic of Kenya (1998, 2000); * Mwabu et al. (1999).

Poverty and policy

World Bank (1994), and Demery and Squire (1996) have provided a valuable quantitative base for investigating the link between policy and poverty. These studies provide a consistent set of data for key variables and a method of combining a range of macroeconomic policies—fiscal, monetary and exchange rate—into a single index. The score for each component is calculated as follows.[2] The fiscal component of the index was based on the overall fiscal balance (excluding external grants) and total revenue. The exchange rate component was based on the real effective exchange rate and the parallel market exchange rate premium (where the latter is estimated as the percentage change of the differences between the parallel market exchange rate and the official exchange rate). The monetary component was based on the rate of inflation and seignorage.[3]

Following the works of the World Bank (1994) and Demery and Squire (1996), macroeconomic policy stance indexes were calculated for the years 1992–1994 and 1994–1997. The results are presented in Table 6.

Table 6: Index of changes in macroeconomic policies: 1982–1997

First survey	Second survey	Change in fiscal Policy	Change in monetary policy	Change in exchange rate policy	Overall change in macroeconomic policies
1982*	1992	1	-1.5	0.50	0.45
1992**	1994	2	-1	1	1.13
1994**	1997	-1	0	1.29	0.30

* Source: Demery and Squire (1996).
** Authors' calculations.

The results show that between 1992 and 1994, the fiscal policy and exchange rate policy stance indexes improved by 2 and 1 percentage points, respectively, while the monetary policy stance index deteriorated by -1. Between 1994 and 1997, the fiscal stance deteriorated by -1 while the monetary policy improved by 1 percentage point compared with the previous period. In absolute terms, however, the monetary policy stance index indicates there was no change in the index between 1994 and 1997. On the other hand, the exchange rate policy stance index improved by 1.29 between 1994 and 1997. The overall macroeconomic policy index implies that macro policies improved by 1.13% between 1992 and 1994 (a change of 150% compared with the previous period) but by only 0.30% (a change of -73% compared with the previous period) between 1994 and 1997. The implication of these results is that as a whole, fiscal policies worsened between 1992 and 1997, while the monetary policy improved marginally. On the other hand, exchange rate policy improved between 1992 and 1994.

Table 7 presents an analysis of the change in macro policy and the corresponding change in poverty over the survey years. The results indicate that the incidence of poverty declined between 1992 and 1994 but increased between 1994 and 1997. To compare changes in macroeconomic policy with changes in poverty between 1982 and 1997, we use results obtained by Demery and Squire for 1982–1992, own calculation for changes in poverty between 1992 and 1994, and Republic of Kenya (1998) for changes in poverty between 1992 and 1994. Mwabu et al. (1999) and Republic of Kenya (2000) are the sources for changes in poverty between 1994 and 1997, and Republic of Kenya (1998, 2000) for changes in poverty between 1994 and 1997.

Table 7: Macroeconomic policy and poverty

Survey years	Change in macro policy (weighted score)	Change in poverty (percentage points per year)
1982/1992[a]	+0.45	-0.28
1992/1994[b]	1.13	-7.99
1992/1994[c]	1.13	-2.27
1994/1997[c]	0.30	6.04
1994/1997[d]	0.30	6.76

Source: [a] Demery and Squire (1996).
[b] Authors' calculations based on Tables 2 and 5.
[c] Authors' calculations based on Table 5 and Republic of Kenya (1998, 2000)
[d] Authors' calculations based on Tables 5 and Mwabu et al. (1999).

On the basis of our own estimates, the incidence of poverty declined by about 8% between 1992 and 1994, while the government results show that poverty declined by 2.3% over the same period. This could be attributed to the remarkable improvement in macroeconomic policies of 150%. However, with Mwabu et al. (1999) and Republic of Kenya (1998), the incidence of poverty increased between 1994 and 1997. Although overall macroeconomic policies improved, we note that compared with 1992–1994, the macroeconomic policy stance index actually declined by 73% between 1994 and 1997. Our results therefore support Demery and Squire (1996), whose findings indicate that an

improvement in macro policy reduces poverty while a deterioration in policy increases poverty.

Although the fiscal policy stance index show a deterioration between 1994 and 1997, improvements in the other policies outweigh this, so that the overall macro index shows an improvement. Our results also confirm that the exchange rate policy is the most successful reform component, while the fiscal component does not necessarily support the argument that fiscal reform is the most fragile component in Kenya. Monetary policy reform seems to be the most fragile reform component.

However, the relationship between poverty and macroeconomic policy changes between 1994 and 1997 could be explained by the argument that macroeconomic reforms are only part of the basis for growth and poverty reduction. We must also recognize the institutional weaknesses and structural impediments that retard the economic and social progress of poor countries (Sahn and Younger, 2001). On the other hand, macroeconomic policies may not have performed as well as expected because of a combination of factors including weather conditions, rising input costs, high domestic interest rates, power shortages, dilapidated physical infrastructure, pre-election violence (1991 and 1998) and other institutional setbacks, which led to a decline in investments, tourism and trade opportunities, thus worsening the poverty situation.

5. Conclusions and policy implications

The main objective of this paper was to analyse the impact of structural adjustment programmes on poverty and economic growth. To achieve the objective, the paper first reviewed the main macroeconomic reform policies to date, then derived poverty measures using the 1992 and 1994 welfare monitoring surveys and the cost of basic needs approach. The paper finally computed indexes of macroeconomic performance and compared changes in these with changes in poverty to assess the impact of macro policies on poverty.

The results indicate that regional food poverty lines ranged from Ksh420 per adult equivalent per month to Ksh617 in 1992 and Ksh597 to Ksh880 in 1994. On average, there was decreased poverty between 1992 and 1994 as shown by all poverty measures, while results from other studies show that poverty increased between 1994 and 1997. Further, the results indicate that poverty measures are more sensitive to changes in mean income than to changes in the distributional component.

The analysis of the impact of macroeconomic reform on poverty indicates that there was a remarkable improvement in macroeconomic policies between 1992 and 1994, while poverty declined. However, there was a deterioration in macroeconomic policy between 1994 and 1997, which led to an increase in poverty. Our results therefore support Demery and Squire (1996), whose findings indicate that an improvement in macro policy reduces poverty while a deterioration in policy increases poverty.

The latter is particularly important for Kenya, which is one of the countries that have not performed too well in terms of economic reforms. This study, too, found that there is a direct link between macroeconomic policy improvement and reduction in poverty. We therefore recommend that the institutional bottlenecks that hinder economic reform should be addressed if Kenya is to alleviate poverty. These include, for example, the government needs to address corruption and other political malpractices, which frequently lead to suspension of donor aid.

Second, there is a large non-market sector in Kenya, which is unlikely to benefit much from economic reform policies. In most cases, these are the groups that are affected adversely in terms of lack of access to services such as education and health. In this regard, we recommend that poverty alleviation policies be pursued hand in hand with reforms so as to ensure equitable distribution of the long-term benefits of growth that may spring from economic reform. Specifically, national social safety valves should be introduced to cushion the poor from the effects of structural adjustment, since available evidence indicates that structural adjustment programmes have shifted the burden of health care financing to the consumer. On the other hand, the study recommends targeting poor families (through bursary schemes, fee waivers, scholarships and grants) as children from well-off families take up opportunities in learning institutions while their poor counterparts drop out.

Notes

1. For conceptual and empirical limitations of the aggregate poverty indexes, see Ravallion 1994.

2 (a) *Fiscal policy scores*
A change in the fiscal deficit of less than -10% points was given a score of -3; from -10 to -5, a score of -2; from -5 to -2, a score of -1; from -2 to 1, a score of 0, from 1 to 3, a score of 1, from 3 to 5, a score of 2; and a deficit change greater than 5, a score of 3. If the change in total revenues was less than -4, the fiscal score was decreased by 1, if greater than 3, the score was increased by 1.

(b) *Monetary policy scores*
A change in seigniorage of greater than 4 was given a score of -3; from 2 to 4, a score of -2; from 1 to 2, a score of -1; from -0.5 to 1, a score 0; -2 to -0.5, a score of 1; -3 to -2, a score of 2; less than -3, a score of 3. A change in inflation of greater than 31% was given a score of -3; from 10 to 31, a score of -2; from 5 to 10, a score of -1; from -2.5 to 5, a score of 0; from -10 to -2.5, a score of 1; from -50 to -10, a score of 2; and less than -50, a score of 3. The overall monetary score was, where possible, a simple average of the seigniorage and inflation scores.

(c) *Exchange rate policy scores*
A change in the real effective exchange rate of less than -10 was given a score of -2; from -10 to -5, a score of -1; from -5 to 2, a score of 0; from 2 to 15, a score of 1; from 15 to 31, a score of 2; greater than 31, a score of 3. A change in the premium of greater than 50 was given a score of -3; from 15 to 50, a score of -2; from 4 to 15, score of -1; from -10 to 5, a score of 0; from -30 to -10, a score of 1; from -100 to -30, a score of 2; and less than -100, a score of 3. The exchange rate policy score was the simple average of the real effective exchange rate and the premium score.

The change in each constituent variable is calculated as the percentage difference in the average of the variable in the year of the first survey and the preceding two years and the average of the variable in the year of the second survey and the two preceding years. The final index is calculated by combining the three components using the following weights: fiscal policy, 36.7%, monetary policy, 11.8% and exchange rate policy, 51.5%

3. The seigniorage was calculated as (M1t - M1t-1)/GDPt -gt (M1/GDP)t, where M1t is the stock of money at the end of period t, GDPt is gross domestic product at time t, and gt is real GDP growth.

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Appendixes

Appendix A: Macroeconomic data

Table A1: Gross domestic product and growth rates (Constant prices) and money stock: 1979–2000

Year	GDP (K£ million)	GDP growth rate (%)	Money stock (M1)
1979	1,545	4.2	519
1980	1,591	3.0	530
1981	2,860	6.0	597
1982	2,944	2.4	689
1983	3,035	3.6	746
1984	3,063	0.9	816
1985	3,240	4.8	899
1986	3,417	5.6	1,100
1987	3,650	4.9	1,144
1988	3,857	5.1	1,211
1989	4,050	5.1	1,316
1990	4,224	4.3	1,678
1991	4,312	2.1	1,717
1992	4,332	0.5	2,470
1993	4,343	0.2	3,029
1994	4,474	3.0	3,364
1995	4,690	4.6	3,666
1996	4,708	2.4	3,962
1997	5,024	1.8	4,553
1998	5,113	1.4	4,736
1999	5,185	0.3	5,504
2000	5,168	1.3	5,168

Source: *Economic Survey*, various issues.

Table A2: Movement in exchange rates and inflation 1980–2000.

Year	SDR exchange rate index	Real effective exchange rate	Parallel market exchange rate	Official exchange rate	Average inflation rate
1980	221	123	8	N/A	13
1984	145	125	17	7	9
1985	129	124	17	16	11
1986	112	101	16	16	6
1987	100	100	18	17	9
1988	89	95	22	18	12
1989	81	94	22	21	13
1990	247	100	23	23	16
1991	205	98	30	28	20
1992	170	103	44	32	28
1993	100	87	92	58	46
1994	98	113	67	56	28
1995	100	118	53	51	2
1996	93	113	60	57	8
1997	96	124	62	59	7
1998	94	130	54	60	N/A
1999	N/A	145	N/A	70	N/A
2000	N/A	101	N/A	77	N/A

N/A: not available
Source : *Economic Survey*, various issues: *African Development Indicators*, 1994–2001.

Table A3: Financing of the fiscal deficit (K£ million, 1984–2000)

Year	External loans (net)	Domestic borrowing	Changes in cash in balances	Fiscal deficit	Revenue
1984/85	25	88	-144	-256	1,887
1985/86	-95	204	-105	-214	2,050
1986/87	1.4	406	-30	-437	2,420
1987/88	71	226	33	-264	2,852
1988/89	200	88	-55	-343	3,455
1989/90	301	265	-33	-533	5,051
1990/91	207	530	-25	-712	6,316
1991/92	12	345	-150	-207	7,142
1992/93	318	752	-602	-468	7,275
1993/94	-568	1,212	-150	-1,005	8,305
1994/95	-107	407	517	217	8,959
1995/96	-3.3	-108	310	-199	8,889
1996/97	-332	955	-403	-220	1,887
1997/98	-357	561	-591	-449	2,050
1998/99	-826	560	142	240	2,420
1999/00*	-688	-869	378	2,075	2,852

* Provisional
Source : *Economic Survey*, various issues.

Appendix B: Estimation of food poverty lines:1992–1994

Table B1: Monthly food poverty line per adult equivalent, Nairobi Province, 1992

Food item	Monthly consumption kg/adult equiv.	Calories per kg	Calorie intake per month	Calorie intake as a ratio of total intake	Calories required per month	Quantity needed to meet requirements, kg/month	Prices Ksh/kg 1992	Food expenditure at poverty line Ksh 1992
(1)	(2)	(3)	(4)	(5)	(60	(7)	(8)	(9)
Bread	5.31	2,400	12,744.00	9.45	6,378.75	2.66	20.41	54.29
Maize	14.22	3,400	48,348.00	35.84	24,192.00	7.12	12.45	88.64
Cereals	3.40	3,300	11,220.00	8.32	5,616.00	1.71	19.99	34.18
Meat	2.19	2,240	4,905.60	3.64	2,457.00	1.10	79.18	87.10
Fish	0.52	2,300	1,196.00	0.89	600.75	0.26	47.75	12.42
Milk	6.22	800	4,976.00	3.69	2,490.75	3.11	18.94	58.90
Eggs	0.45	1,400	630.00	0.47	317.25	0.23	65.43	15.05
Oils & fats	1.61	8,800	14,168.00	10.50	7,087.50	0.81	60.05	48.64
Fruits	3.56	900	3,204.00	2.38	1,606.50	1.78	9.99	17.78
Vegetables	15.17	400	6,068.00	4.50	3,037.50	7.59	9.50	72.11
Beans	2.04	3,100	6,324.00	4.69	3,165.75	1.02	25.46	25.97
Roots	6.40	1,400	8,960.00	6.64	4,482.00	3.20	7.95	25.44
Sugar	3.22	3,750	12,075.00	8.95	6,041.25	1.61	31.83	51.25
Tea/coffee	0.31	240	74.40	0.06	40.50	0.17	147.29	25.04
Total			134,893.00	100.00	67,500.00			616.81

Note: Col 1-4 are derived from data; col5 = col4/Scol4; col6 = col5/100*67500; col7 = col6/col3; col8 = given; col9=col8*col7

Table B2: Monthly food poverty line per adult equivalent, Coast province, 1992

Food item	Monthly consumption kg/adult equiv.	Calories per kg	Calorie intake per month	Calorie intake as a ratio of total intake	Calories required per month	Quantity needed to meet requirements, kg/month	Prices Ksh/kg 1992	Food expenditure at poverty line Ksh 1992
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Bread	0.71	2,400	1,704	1.96	1,323.00	0.55	20.21	11.12
Maize	17.80	3,400	60,520	69.65	47,013.75	13.83	12.32	170.39
Cereals	1.46	3,300	4,818	5.54	3,739.50	1.33	19.79	26.32
Meat	0.72	2,000	1,440	1.66	1,120.50	0.56	78.39	43.90
Fish	0.43	2,300	989	1.14	769.50	0.33	47.27	15.60
Milk	1.35	800	1,080	1.24	837.00	1.05	18.75	19.69
Eggs	0.07	1,400	98	0.11	74.25	0.05	64.77	3.24
Oils & fats	0.26	8,800	2,288	2.63	1,775.25	0.20	59.44	11.89
Fruits	1.34	900	1,206	1.39	938.25	1.04	9.89	10.29
Vegetables	4.94	400	1,976	2.27	1,532.25	3.83	9.41	36.04
Beans	1.60	3,100	4,960	5.71	3,854.25	1.24	25.21	31.26
Roots	1.17	1,400	1,638	1.89	1,275.75	0.91	7.87	7.16
Sugar	1.11	3,750	4,163	4.79	3,233.25	0.86	31.51	27.10
Tea/coffee	0.07	240	17	0.02	13.50	0.06	145.82	8.75
Total			86,896	100 .00	67,500 .00			419.79

Note: Col 1-4 are derived from data; col5 = col4/Σcol4; col6 = col5/100*67500; col7 = col6/col3; col8 = given; col9=col8*col7

Table B3: Monthly food poverty line per adult equivalent, Eastern province, 1992

Food item	Monthly consumption kg/adult equiv.	Calories per kg	Calorie intake per month	Calorie intake as a ratio of total intake	Calories required per month	Quantity needed to meet requirements kg/month	Prices Ksh/kg 1992	Food expenditure at poverty line Ksh 1992
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Bread	0.44	2,400	1,056	1.26	850.50	0.35	19.39	6.79
Maize	13.37	3,400	45,458	54.09	36,510.75	10.74	11.82	126.95
Cereals	2.10	3,300	6,930	8.25	5,568.75	1.69	18.99	32.09
Meat	0.68	2,000	1,360	1.62	1,093.50	0.55	75.23	41.38
Fish	0.01	2,300	23	0.03	20.25	0.01	45.37	0.45
Milk	3.67	800	2,936	3.49	2,355.75	2.94	17.99	52.89
Eggs	0.11	1,400	154	0.18	121.50	0.09	62.16	5.59
Oils & fats	0.33	8,800	2,904	3.46	2,335.50	0.27	57.05	15.40
Fruits	1.76	900	1,584	1.88	1,269.00	1.44	9.49	13.67
Vegetables	1.48	400	592	0.70	472.50	1.18	9.03	10.66
Beans	4.19	3,100	12,989	15.46	10,435.50	3.37	24.19	81.52
Roots	2.20	1,400	3,080	3.66	2,470.50	11.76	7.55	88.79
Sugar	1.32	3,750	4,950	5.89	3,975.75	1.06	30.24	32.05
Tea/coffee	0.11	240	26	0.03	20.25	0.08	139.92	11.19
Total			84,042	100.00	67,500.00			519.42

Note: Col 1-4 are derived from data; col5 = col4/Σcol4; col6 = col5/100*67500; col7 = col6/col3; col8 = given; col9=col8*col7

Table B4: Monthly food poverty line per adult equivalent, Central province, 1992

Food item	Monthly consumption kg/adult equiv.	Calories per kg	Calorie intake per month	Calorie intake as a ratio of total intake	Calories required per month	Quantity needed to meet requirements kg/month	Prices Ksh/kg 1992	Food expenditure at poverty line Ksh 1992
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Bread	0.64	2,400	1,536	2.08	1,404.00	0.59	18.99	11.20
Maize	10.59	3,400	36,006	48.67	32,852.25	9.66	11.57	111.77
Cereals	1.66	3,300	5,478	7.41	5,001.75	1.51	18.59	28.07
Meat	0.61	2,000	1,220	1.65	1,113.75	0.56	73.64	41.24
Fish	0.01	2,300	23	0.03	20.25	0.01	44.41	0.44
Milk	4.98	800	3,984	5.39	3,638.25	4.55	17.61	80.13
Eggs	0.21	1,400	294	0.40	270.00	0.19	60.85	11.56
Oils & fats	0.44	8,800	3,872	5.23	3,530.25	0.40	55.85	22.34
Fruits	1.85	900	1,665	2.25	1,518.75	1.69	9.29	15.70
Vegetables	2.53	400	1,012	1.37	924.75	2.31	8.84	20.42
Beans	2.29	3,100	7,099	9.60	6,480.00	2.09	23.68	49.49
Roots	4.26	1,400	5,964	8.06	5,440.50	3.89	7.39	28.75
Sugar	1.54	3,750	5,775	7.81	5,271.75	1.41	29.60	41.74
Tea/coffee	0.16	240	38	0.05	33.75	0.14	136.98	19.18
Total			73,966	100.00	67,500.00			481.55

Note: Col 1-4 are derived from data; col5 = col4/Σcol4; col6 = col5/100*67500; col7 = col6/col3; col8 = given; col9=col8*col7

Table B5: Monthly food poverty line per adult equivalent, Rift Valley province, 1992

Food item	Monthly consumption kg/adult equiv.	Calories per kg	Calorie intake per month	Calorie intake as a ratio of total intake	Calories required per month	Quantity needed to meet requirements, kg/month	Prices Ksh/kg 1992	Food expenditure at poverty line Ksh 1992
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Bread	0.35	2,400	840	1.03	692.25	0.29	18.99	5.57
Maize	14.94	3,400	50,796	62.54	42,214.50	12.42	11.57	143.70
Cereals	1.25	3,300	4,125	5.08	3,429.00	1.04	18.59	19.33
Meat	0.87	2,000	1,740	2.14	1,444.50	0.72	73.64	53.02
Fish	0.04	2,300	92	0.11	74.25	0.03	44.41	1.33
Milk	6.82	800	5,456	6.72	4,536.00	5.67	17.61	99.85
Eggs	0.18	1,400	252	0.31	209.25	0.15	60.85	9.13
Oils & fats	0.36	8,800	3,168	3.90	2,632.50	0.3	55.85	16.76
Fruits	1.41	900	1,269	1.60	1,080.00	1.2	9.29	11.15
Vegetables	1.80	400	720	0.89	600.75	1.5	8.84	13.26
Beans	1.16	3,100	3,596	4.43	2,990.25	0.96	23.68	22.73
Roots	1.89	1,400	2,646	3.26	2,200.50	1.57	7.39	11.6
Sugar	1.73	3,750	6,488	7.99	5,393.25	1.44	29.6	42.62
Tea/coffee	0.14	240	34	0.04	27.00	0.11	136.98	15.07
Total			81,221	100.00	67,500.00			465.06

Note: Col 1–4 are derived from data; col5 = col4/Σcol4; col6 = col5/100*67500; col7 = col6/col3; col8 = given; col9=col8*col7

Table B6: Monthly food poverty line per adult equivalent, Nyanza province, 1992

Food item	Monthly consumption kg/adult equiv.	Calories per kg	Calorie intake per month	Calorie intake as a ratio of total intake	Calories required per month	Quantity needed to meet requirements, kg/month	Prices Ksh/kg 1992	Food expenditure at poverty line Ksh 1992
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Bread	0.77	2,400	1,848	2.12	1,431.00	0.60	18.58	11.15
Maize	15.55	3,400	52,870	60.60	40,905.00	12.03	11.32	136.18
Cereals	2.91	3,300	9,603	11.01	7,431.75	2.25	18.19	40.93
Meat	1.26	2,000	2,520	2.89	1,950.75	0.98	72.06	70.62
Fish	0.62	2,300	1,426	1.63	1,100.25	0.48	43.45	20.86
Milk	2.37	800	1,896	2.17	1,464.75	1.83	17.23	31.53
Eggs	0.07	1,400	98	0.11	74.25	0.05	59.54	2.98
Oils & fats	0.40	8,800	3,520	4.03	2,720.25	0.31	54.65	16.94
Fruits	0.84	900	756	0.87	587.25	0.65	9.09	5.91
Vegetables	4.46	400	1,784	2.04	1,377.00	3.44	8.65	29.76
Beans	0.54	3,100	1,674	1.92	1,296.00	0.42	23.17	9.73
Roots	2.02	1,400	2,828	3.24	2,187.00	1.56	7.23	11.28
Sugar	1.71	3,750	6,413	7.35	4,961.25	1.32	28.97	38.24
Tea/coffee	0.05	240	12	0.01	6.75	0.03	134.03	4.08
Total			87,248	100.00	67,500.00			430.14

Note: Col 1–4 are derived from data; col5 = col4/Σcol4; col6 = col5/100*67500; col7 = col6/col3; col8 = given; col9=col8*col7

Table B7: Monthly food poverty line per adult equivalent, Western province, 1992

Food item	Monthly consumption kg/adult equiv.	Calories per kg	Calorie intake per month	Calorie intake as a ratio of total intake	Calories required per month	Quantity needed to meet requirements, kg/month	Prices Ksh/kg 1992	Food expenditure at poverty line Ksh 1992
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Bread	0.58	2,400	1,392	1.70	1,147.50	0.48	19.39	9.31
Maize	15.69	3,400	53,346	65.22	44,023.50	12.95	11.83	153.20
Cereals	1.52	3,300	5,016	6.13	4,137.75	1.25	18.99	23.74
Meat	1.14	2,000	2,280	2.79	1,883.25	0.94	75.23	70.72
Fish	0.26	2,300	598	0.73	492.75	0.21	45.39	9.53
Milk	2.94	800	2,352	2.88	1,944.00	2.43	17.99	43.72
Eggs	0.08	1,400	112	0.14	94.50	0.07	62.16	4.35
Oils & fats	0.29	8,800	2,552	3.12	2,106.00	0.24	57.05	13.69
Fruits	1.01	900	909	1.11	749.25	0.83	9.49	7.88
Vegetables	5.08	400	2,032	2.48	1,674.00	4.19	9.03	37.84
Beans	0.80	3,100	2,480	3.03	2,045.25	0.66	24.19	15.97
Roots	1.45	1,400	2,030	2.48	1,674.00	1.20	7.55	9.06
Sugar	1.78	3,750	6,675	8.16	5,508.00	1.47	30.24	44.45
Tea/coffee	0.10	240	24	0.03	20.25	0.08	139.92	11.19
Total			81,798	100.00	67,500.00			454.65

Note: Col 1–4 are derived from data; col5 = col4/Σcol4; col6 =col5/100*67500; col7 = col6/col3; col8 = given; col9=col8*col7

Table B8: National monthly rural poverty line per adult equivalent, 1992

Food item	Monthly consumption kg/adult equiv.	Calories per kg	Calories intake per month	Calories intake as a ratio of total intake	Calories required per month kg/month	Quantity needed requirements	Prices Ksh/kg 1992	Food expenditure at poverty line Ksh 1992
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Bread	0.54	2,400	1,288	1.65	1,113.71	0.46	20.59	9.47
Maize	13.37	3,400	45,445	58.23	39,305.20	11.56	11.89	137.45
Cereals	1.73	3,300	5,717	7.33	4,944.40	1.5	20.75	31.13
Meat	0.81	2,000	1,618	2.07	1,399.47	0.7	79.52	55.66
Fish	0.16	2,300	362	0.46	313.24	0.14	56.42	7.9
Milk	4.07	800	3,256	4.17	2,815.90	3.52	19.04	67.02
Eggs	0.13	1,400	187	0.24	161.35	0.12	78.62	9.43
Oils & fats	0.35	8,800	3,078	3.94	2,661.79	0.3	57.54	17.26
Fruits	1.2	900	1,082	1.39	936.09	1.04	9.52	9.9
Vegetables	3.12	400	1,248	1.60	1,079.58	2.7	10.26	27.7
Beans	1.87	3,100	5,784	7.41	5,002.38	1.61	23.93	38.53
Roots	2.39	1,400	33,445	4.29	2,893.42	2.07	9.03	18.69
Sugar	1.5	3,750	5,608	7.19	4,850.18	1.29	34.1	43.99
Tea/coffee	0.11	240	27	0.03	23.31	0.1	212.04	21.2
Total			78,044	100.oo	67,500.00			495.33

Note: Col 1–-4 are derived from data; col5 = col4/Σcol4; col6 = col5/100*67500; col7 = col6/col3; col8 = given; col9=col8*col7

Table B9: Monthly food poverty line per adult equivalent, Nairobi province, 1994

Food item	Monthly consumption kg/adult equiv.	Calories per kg	Calorie intake per month	Calorie intake as a ratio of total intake	Calories required per month	Quantity needed to meet requirements, kg/month	Prices Ksh/kg 1994	Food expenditure at poverty line Ksh 1994
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Bread	5.31	2,400	12,744	9.45	6,378.75	2.66	29.11	77.43
Maize	14.22	3,400	48,348	35.84	24,192.00	7.12	17.74	126.31
Cereals	3.40	3,300	11,220	8.32	5,616.00	1.71	28.51	48.75
Meat	2.19	2,240	4,906	3.64	2,457.00	1.10	112.89	124.18
Fish	0.52	2,300	1,196	0.89	600.80	0.26	68.08	17.70
Milk	6.22	800	4,976	3.69	2,490.80	3.11	27.00	83.97
Eggs	0.45	140	630	0.48	324.00	0.23	93.28	21.45
Oils & fats	1.61	8,800	14,168	10.50	7,087.50	0.81	85.61	69.34
Fruits	3.56	900	3,204	2.38	1,606.50	1.78	14.24	25.35
Vegetables	15.17	400	6,068	4.50	3,037.50	7.59	13.55	102.84
Beans	2.04	3,100	6,324	4.69	3,165.80	1.02	36.30	37.03
Roots	6.40	1,400	8,960	6.64	4,482.00	3.20	11.33	36.26
Sugar	3.22	3,750	12,075	8.95	6,041.30	1.61	45.38	73.06
Tea/coffee	0.31	240	74	0.06	40.50	0.17	209.99	35.70
Total			134,893	100.00	67,500.00			879.72

Note: Col 1–4 are derived from data; col5 = col4/Σcol4; col6 = col5/100*67500; col7 = col6/col3; col8 = given; col9=col8*col7

Table B10: Monthly food poverty line per adult equivalent, Coast province, 1994

Food item	Monthly consumption kg/adult equiv.	Calories per kg	Calorie intake per month	Calorie intake as a ratio of total intake	Calories required per month	Quantity needed to meet requirements kg/month	Prices Ksh/kg 1994	Food expenditure at poverty line Ksh 1994
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Bread	0.71	2,400	1,704	1.96	1,323.00	0.55	28.82	15.89
Maize	17.80	3,400	60,520	69.65	47,013.75	13.83	17.56	242.81
Cereals	1.46	3,300	4,818	5.54	3,739.50	1.33	28.22	31.98
Meat	0.72	2,000	1,440	1.66	1,120.50	0.56	111.76	62.61
Fish	0.43	2,300	989	1.14	769.50	0.33	67.4	22.55
Milk	1.35	800	1,080	1.24	837.00	1.05	26.73	27.97
Eggs	0.07	1,400	98	0.11	74.25	0.05	92.35	4.90
Oils & fats	0.26	8,800	2,288	2.63	1,775.25	0.20	84.75	17.10
Fruits	1.34	900	1,206	1.39	938.25	1.04	14.1	14.70
Vegetables	4.94	400	1,976	2.27	1,532.25	3.83	13.41	51.37
Beans	1.60	3,100	4,960	5.71	3,854.25	1.24	35.94	44.68
Roots	1.17	1,400	1,638	1.89	1,275.75	0.91	11.22	10.22
Sugar	1.11	3,750	4,163	4.79	3,233.25	0.86	44.93	38.74
Tea/coffee	0.07	240	17	0.02	13.50	0.06	207.9	11.69
Total			86,896	100.oo	67,500.00			597.21

Note: Col 1–4 are derived from data; col5 = col4/Σcol4; col6 = col5/100*67500; col7 = col6/col3; col8 = given; col9=col8*col7

Table B11: Monthly food poverty line per adult equivalent, Central province, 1994

Food item	Monthly consumption kg/adult equiv.	Calories per kg	Calorie intake per month	Calorie intake as a ratio of total intake	Calories required per month	Quantity needed to meet requirements, kg/month	Prices Ksh/kg 1994	Food expenditure at poverty line Ksh 1994
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Bread	0.44	2,400	1,056	1.26	850.50	0.35	27.65	9.80
Maize	13.37	3,400	45,458	54.09	36,510.75	10.74	16.85	180.94
Cereals	2.10	3,300	6,930	8.25	5,568.75	1.69	27.08	45.70
Meat	0.68	2,000	1,360	1.62	1,093.50	0.55	107.25	58.64
Fish	0.01	2,300	23	0.03	20.25	0.01	64.68	0.57
Milk	3.67	800	2,936	3.49	2,355.75	2.94	25.65	75.53
Eggs	0.11	1,400	154	0.18	121.50	0.09	88.62	7.69
Oils & fats	0.33	8,800	2,904	3.46	2,335.50	0.27	81.33	21.58
Fruits	1.76	900	1,584	1.88	1,269.00	1.44	13.53	19.48
Vegetables	1.48	400	592	0.70	472.50	1.18	12.87	15.10
Beans	4.19	3,100	12,989	15.46	10,435.50	3.37	34.49	116.10
Roots	2.20	1,400	3,080	3.66	2,470.50	1.76	10.76	18.99
Sugar	1.32	3,750	4,950	5.89	3,975.75	1.06	43.11	45.71
Tea/coffee	0.11	240	26	0.03	20.25	0.08	199.49	16.83
Total			84,042	100.00	67,500.00			632.72

Note: Col 1–4 are derived from data; col5 = col4/Σcol4; col6 = col5/100*67500; col7 = col6/col3; col8 = given; col9=col8*col7

Table B12: Monthly food poverty line per adult equivalent, Eastern province, 1994.

Food item	Monthly consumption kg/adult equiv.	Calories per kg	Calories intake per month	Calories intake as a ratio of total intake	Calories required per month kg/month	Quantity needed requirements	Prices Ksh/kg 1994	Food expenditure at poverty line Ksh 1994
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Bread	0.64	2,400	1,536	2.08	1,404.00	0.59	27.07	15.84
Maize	10.59	3,400	36,006	48.66	32,845.30	9.66	16.50	159.40
Cereals	1.66	3,300	5,478	7.40	4,995.00	1.51	26.51	40.13
Meat	0.61	2,000	1,220	1.65	1,113.75	0.56	104.99	58.47
Fish	0.01	2,300	23	0.03	20.25	0.01	63.31	0.56
Milk	4.98	800	3,984	5.38	3,631.15	4.54	25.11	113.90
Eggs	0.21	1,400	294	0.40	270.00	0.19	86.75	16.73
Oils & fats	0.44	8,800	3,872	5.23	3,530.25	0.40	79.62	31.94
Fruits	1.85	900	1,665	2.25	1,518.75	1.69	13.24	22.34
Vegetables	2.53	400	1,012	1.37	924.75	2.31	12.60	29.13
Beans	2.29	3,100	7,099	9.60	6,480.00	2.09	33.76	70.57
Roots	4.26	1,400	5,964	8.06	5,440.50	3.89	10.54	40.96
Sugar	1.54	3,750	5,775	7.80	5,265.00	1.40	42.20	59.75
Tea/coffee	0.16	240	38	0.05	33.75	0.14	195.29	27.46
Total			73,996	100.00	67,500.00			686.75

Note: Col 1–4 are derived from data; col5 = col4/Σcol4; col6 = col5/100*67500; col7 = col6/col3; col8 = given; col9=col8*col7

Table B13: Monthly food poverty line per adult equivalent, Rift Valley province, 1994

Food item	Monthly consumption kg/adult equiv.	Calories per kg	Calorie intake per month	Calorie intake as a ratio of total intake	Calories required per month	Quantity needed to meet requirements kg/month	Prices Ksh/kg 1994	Food expenditure at poverty line Ksh 1994
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Bread	0.35	2,400	840	1.03	692.25	0.29	27.07	7.81
Maize	14.94	3,400	50,796	62.54	42,214.50	12.42	16.5	204.86
Cereals	1.25	3,300	4,125	5.08	3,429.00	1.04	26.51	27.55
Meat	0.87	2,000	1,740	2.14	1,444.50	0.72	104.99	75.83
Fish	0.04	2,300	92	0.11	74.25	0.03	63.31	2.04
Milk	6.82	800	5,456	6.72	4,536.00	5.67	25.11	142.37
Eggs	0.18	1,400	252	0.31	209.25	0.15	86.75	12.97
Oils & fats	0.36	8,800	3,168	3.90	2,632.50	0.30	76.62	22.92
Fruits	1.41	900	1,269	1.60	1,080.00	1.20	13.24	15.89
Vegetables	1.80	400	720	0.89	600.75	1.50	12.60	18.92
Beans	1.16	3,100	3,596	4.43	2,990.25	0.96	33.76	35.56
Roots	1.89	1,400	2,646	3.26	2,200.50	1.57	10.54	16.57
Sugar	1.73	3,750	6,488	7.99	5,393.25	1.44	42.2	60.69
Tea/coffee	0.14	240	34	0.04	27.00	0.11	195.29	21.97
Total			81,222	100.00	67,500.00			665.95

Note: Col 1–4 are derived from data; col5 = col4/Σcol4; col6 = col5/100*67500; col7 = col6/col3; col8 = given; col9=col8*col7

Table B14: Monthly food poverty line per adult equivalent, Nyanza province, 1994

Food item	Monthly consumption kg/adult equiv.	Calories per kg	Calorie intake per month	Calorie intake as a ratio of total intake	Calories required per month	Quantity needed to meet requirements, kg/month	Prices Ksh/kg 1994	Food expenditure at poverty line Ksh 1994
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Bread	0.77	2,400	1,848	2.12	1,431.00	0.60	26.49	15.89
Maize	15.55	3,400	52,870	60.60	40,905.00	12.03	16.14	194.16
Cereals	2.91	3,300	9,603	11.01	7,431.75	2.25	25.94	58.37
Meat	1.26	2,000	2,520	2.89	1,950.75	0.98	102.73	100.2
Fish	0.62	2,300	1,426	1.63	1,100.25	0.48	61.95	26.63
Milk	2.37	800	1,896	2.17	1,464.75	1.83	24.57	44.99
Eggs	0.07	1,400	98	0.11	74.25	0.05	84.88	4.5
Oils & fats	0.40	8,800	3,520	4.03	2,720.25	0.31	77.91	24.08
Fruits	0.84	900	756	0.87	587.25	0.65	12.96	8.46
Vegetables	4.46	400	1,784	2.04	1,377.00	3.44	12.33	42.45
Beans	0.54	3,100	1,674	1.92	1,296.00	0.42	33.03	13.81
Roots	2.02	1,400	2,828	3.24	2,187.00	1.56	10.31	16.11
Sugar	1.71	3,750	6,413	7.35	4,961.25	1.32	41.30	54.64
Tea/coffee	0.05	240	12	0.01	6.75	0.03	191.09	5.37
Total			87,248	100.00	67,500.00			609.66

Note: Col 1–4 are derived from data; col5 = col4/Σcol4; col6 = col5/100*67500; col7 = col6/col3; col8 = given; col9=col8*col7

Table B15: Monthly food poverty line per adult equivalent, Western province, 1994

Food item	Monthly consumption kg/adult equiv.	Calories per kg	Calorie intake per month	Calorie intake as a ratio of total intake	Calories required per month	Quantity needed to meet requirements, kg/month	Prices Ksh/kg 1994	Food expenditure at poverty line Ksh 1994
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Bread	0.58	2,400	1,392	1.70	1,147.50	0.48	27.65	13.22
Maize	15.69	3,400	53,346	65.22	44,023.50	12.95	16.85	218.18
Cereals	1.52	3,300	5,016	6.13	4,137.75	1.25	27.08	33.95
Meat	1.14	2,000	2,280	2.79	1,883.25	0.94	107.25	100.99
Fish	0.26	2,300	598	0.73	492.75	0.21	64.68	13.86
Milk	2.94	800	2,352	2.88	1,944.00	2.43	25.65	62.33
Eggs	0.08	1,400	112	0.14	94.50	0.07	88.62	5.98
Oils & fats	0.29	8,800	2,552	3.12	2,106.00	0.24	81.33	19.46
Fruits	1.01	900	909	1.11	749.25	0.83	13.53	11.23
Vegetables	5.08	400	2,032	2.48	1,674.00	4.19	12.87	53.86
Beans	0.80	3,100	2,480	3.03	2,045.25	0.66	34.49	22.76
Roots	1.45	1,400	2,030	2.48	1,674.00	1.20	10.76	12.87
Sugar	1.78	3,750	6,675	8.16	5,508.00	1.47	43.11	63.34
Tea/coffee	0.10	240	24	0.03	20.25	0.08	199.49	16.83
Total			81,798	100.00	67,500.00	67,500.00		648.86

Note: Col 1–4 are derived from data; col5 = col4/Σcol4; col6 = col5/100*67500; col7 = col6/col3; col8 = given; col9=col8*col7

Table B16: National monthly rural poverty line per adult equivalent, 1994.

Food item	Monthly consumption kg/adult equiv.	Calories per kg	Calories intake per month	Calorie intake as a ratio of total intake	Calorie required per month	Quantity needed to meet requirements kg/month	Prices Ksh/kg 1994	Food expenditure at poverty line Ksh 1994
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Bread	0.54	2,400	1,288	1.65	1,113.71	0.46	29.35	13.62
Maize	13.37	3,400	45,445	58.23	39,305.20	11.56	16.95	195.95
Cereals	1.73	3,300	5,717	7.33	4,944.40	1.50	29.59	44.33
Meat	0.81	2,000	1,618	2.07	1,399.47	0.70	113.51	79.43
Fish	0.16	2,300	362	0.46	313.24	0.14	80.44	10.96
Milk	4.07	800	3,256	4.17	2,815.90	3.52	27.15	95.56
Eggs	0.13	1,400	187	0.24	161.35	0.12	93.93	10.83
Oils & fats	0.35	8,800	3,078	3.94	2,661.79	0.30	82.03	24.81
Fruits	1.20	900	1,082	1.39	936.09	1.04	13.57	14.11
Vegetables	3.12	400	1,248	1.60	1,079.58	2.70	14.63	39.49
Beans	1.87	3,100	5,784	7.41	5,002.38	1.61	34.12	55.06
Roots	2.39	1,400	33,445	4.29	2,893.42	2.07	12.88	26.62
Sugar	1.50	3,750	5,608	7.19	4,850.18	1.29	48.61	62.87
Tea/coffee	0.11	240	27	0.03	23.31	0.10	302.30	29.36
Total			78,044	100.00	67,500.00			702.99

Source: Economic Survey 1997.

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