# Impact of Agricultural Trade and Related Policy Reforms on Food Security in Kenya

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## Abstract

*Kenya's agricultural sector has undergone various changes emanating from policy reforms over the years. These reforms, which occurred from the late 1980s to the early 1990s, were aimed at reducing government involvement in economic activity and allowing the economy to move towards a free market. Policy reforms covered monetary, fiscal and trade aspects and liberalization of the agricultural sector. This study analyses the impact of specific reforms on agricultural production, performance and trade, and therefore food security. The study uses secondary data from the Central Bureau of Statistics and the Ministry of Agriculture. Welfare Monitoring Surveys of 1982, 1992 and 1997 were used as sources of regional cross-sectional household data. Trends in production and trade are analysed, the impact of policy instruments such as prices and market access explained, household incomes and expenditures estimated, and food security trends are analysed using various indicators for both the pre- and post-reforms periods.*

*The analysis indicates that agricultural prices and production have generally declined. The performance of the agricultural sector in the 1990s was dismal, with annual growth in agricultural GDP averaging 2% compared with 4% in the 1980s. Agricultural export growth after the reforms has shown mixed trends due to market access limitations for Kenyan exports. Market access for imports into the Kenyan market has improved since the reforms, occasioning tremendous import growth. However, the capacity to import food has declined, making the country more food insecure. The balance of trade between Kenya and the rest of the world has worsened against Kenya. After the reforms the country moved from broad self-sufficiency in production of most food staples to a net importer.*

*The sources of food security for rural people are subsistence food production and purchases using farm or off-farm income, with a third of households receiving remittances. The linkage between the performance of the agricultural sector and household incomes indicates that when the performance of the sector is poor, household incomes are low. In the light of these challenges, the country needs to reconsider increasing the use of domestic support measures allowed within the World Trade Organization (WTO) agreement on agriculture to allow adequate development of the sector. However, implementation of liberalized policies should be harmonized and coordinated to avoid adverse effects on the sector.*

This Discussion Paper is produced under the Umbrella Project for *Improving the Enabling Environment for Businesses in Kenya*. The aim of the Project is to improve the policy, legal, and regulatory environment for businesses. The Project has three components. The **Simplifying the Regulatory Environment for Business (SREB)** component involves research on constraints to operation of business by the private sector in Kenya. The **Private Sector Advocacy** component assists the private sector in advocating for reforms that create a favourable environment for business and investment. The **Capacity Building** component aims to build capacity in line ministries and regulatory agencies to respond to reform proposals made by the private sector and other stakeholders. KIPPRA implements the first and third components while the Kenya Private Sector Alliance implements the advocacy component. The Project is funded by the British Department for International Development (DfID).

## Abbreviations and acronyms

| | |
|---|---|
| ACP-EU | African Caribbean Pacific-European Union |
| AFC | Agricultural Finance Corporation |
| AI | artificial insemination |
| ALDEV | African Land Development Unit |
| ASALs | arid and semi-arid lands |
| CBK | Central Bank of Kenya |
| CBS | Central Bureau of Statistics |
| CIDR | cereal import dependency ratio |
| CIF | Cost, Insurance, Freight |
| COMESA | Common Market for Eastern and Southern Africa |
| COPI | cereals output price index |
| CPI | consumer price index |
| CRSP | cereals self-provision ratio |
| EAC | East African Community |
| EPZ | export processing zone |
| EU | European Union |
| FOB | free-on-board |
| FPI | food production index |
| HCDA | Horticultural Crops Development Authority |
| IMF | International Monetary Fund |
| KARI | Kenya Agricultural Research Institute |
| KCC | Kenya Cooperative Creameries |
| KEBS | Kenya Bureau of Standards |
| KTDA | Kenya Tea Development Authority |
| MUB | manufacturing under bond |
| NCPB | National Cereals and Produce Board |
| NIB | National Irrigation Board |
| OAU | Organization of African Unity |
| PSI | Pre-Shipment Inspection |
| SAPs | Structural Adjustment Programmes |
| URAA | Uruguay Round Agreement on Agriculture |
| WMS | Welfare Monitoring Surveys |
| WPI | Wages Price Index |
| WTO | World Trade Organization |

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# 1. Introduction

The shaping of international disciplines on market access, domestic support, export subsidies and other related factors for agricultural products through the World Trade Organization (WTO) has multiple consequences on food security especially in developing countries. Among the broader economic reforms promoted by the International Monetary Fund (IMF) and the World Bank, developing countries have implemented structural adjustment programmes (SAPs) in the agricultural sector directed at correcting a perceived bias against agriculture in these countries (Krueger *et al*, 1988). The policy package, which was general for all developing countries, included reduction or elimination of government subsidies (to producers as well as consumers), market deregulation, unilateral reductions in import tariffs, elimination of agricultural export duties and privatization of agricultural marketing and service provision. These sectoral reforms were accompanied by liberalization the foreign exchange, trade and financial markets. Moreover, agricultural policy reforms in most countries were deepened by the commitments these countries made in the Uruguay Round Agreement on Agriculture (URAA) in 1986.

Economic and trade policy reforms pertain to the shift from government control of economic activities and trade to a liberalized economy. On the basis of this definition, economic policies in Kenya since independence can be grouped under two distinct categories. First are policies under which direct government control and participation dominated economic activities, including control of foreign exchange, investment and production activities (era of government controls, 1963 to 1980). Second are policies under which government participation in economic activities was reduced and market forces and private individuals or organizations became the major players in agricultural production, marketing and investment (era of liberalized economy, 1980

to date). Although market liberalization started in 1980 under SAPs, it was not until 1993 that rigorous implementation of related policy reforms started. For this reason, the policy reform period considered in this study starts in 1993. Implementation of the reforms before 1993 was accompanied by considerable official ambiguity and covert and overt resistance, but this changed from the year 1993 when the reforms were implemented with greater commitment (Ikiara *et al*, 1993; Nyangito, 1999).

This study analyses the impact of specific reforms on trade, agricultural production and the overall agricultural sector performance and therefore food security. Food security is defined as "Access by all people at all times to enough food for an active healthy life" (Ellis, 1992). The World Food Summit in 1996 stated that food security can only exist when all people have physical and economic access to sufficient, safe and nutritious food at all times to meet their dietary needs and food preferences for an active and healthy life. Food security at the macro level (national) implies that adequate supplies of food are available through domestic production or through imports to meet the consumption needs of all in a country. At the micro level (household or individual), food security depends on a number of factors, which are related for the most part to various forms of entitlements to income and food producing assets, andto the links between domestic and external markets and the transmission effects from the latter on small, low-income and resource-poor producers and consumers. This study documents the nature and status of reforms in Kenya and links policy reforms to food security.

Although the Uruguay Round established a framework for agricultural trade reform through establishment of the WTO, and legalization of government intervention in agricultural markets of industrialized countries, it reinforced the distorting effects of this intervention. These

reforms in trade control measures that emanated from the URAA were implemented despite distortions in the world agricultural markets arising from domestic production support measures and export subsidies utilized by the rich countries that could afford them. Agricultural production in developing countries is still hampered by substantial distortions in the pattern of international trade owing to continued protection and support to agriculture mainly in industrialized countries. It therefore becomes increasingly important to document the nature and status of economic and trade policy reforms in Kenya, their impact on agricultural production, trade and performance and the linkage between policy reforms and food security.

## 1.1 Objectives

The purpose of this study is to draw lessons from policy reforms on the agricultural sector in Kenya and how these have affected food security. The study seeks to identify the economic and trade policy reforms introduced in the country and their specific impact on production, trade and domestic food security at the national and household levels. The specific objectives of the study were to analyse:

- Policy reforms, agricultural sector performance and food security trends;
- The impact of the reforms on agricultural production and trade; and
- The food security implications of the policy reforms.

## 1.2 Methodology

The study relies heavily on secondary data. The data were obtained from the Central Bureau of Statistics (CBS) of the Ministry of Planning and National Development and the Ministry of Agriculture and Rural

Development. These comprised time series data on production and trade and household attributes such as food production, consumption, incomes and expenditures. Cross-sectional data were collected from household welfare monitoring surveys (WMS of 1982, 1992 and 1997). The data were verified through discussions with staff in the Ministry of Agriculture and at CBS.

The study analyses 1) trends in agricultural production and trade to indicate the changes arising from the implementation of policy reforms, 2) impacts of various policy instruments such as prices and market access to help explain changes in agricultural production and trade, and 3) food security using various indicators. At the national level, the indicators used include:

- Food production indices such as per capita food production, food production index (FPI) and cereals self-provision ratio (CRSP);
- Capacity to import, such as the ratio of the value of food imports to the value of agricultural exports, the ratio of the value of food imports to the value of total exports, and the cereal import dependency ratio (CIDR);
- Malnutrition status  supply of dietary proteins, fats and cereals.

The indicators at the household level included income availability and food consumption patterns. The trends in these indicators were analysed for both before and after policy reforms to demonstrate the impact policy reforms have had on food security.

# 2. Overview of Kenya's Resources and Socioeconomic Status

Kenya is situated on the east coast of Africa and lies along the equator. The country has a total surface area of about 587,000 km$^2$, out of which about 11,000 km$^2$ is covered with water. The country has a coastline of about 600 km along the Indian Ocean. The vast landmass of the country and the distance from the sea have important implications on agricultural production. Most of Kenya's agricultural commodities are produced in the hinterland, away from the shipping port of Mombasa through which most exports and imports pass. The cost of transporting inputs inland or exports from the hinterland affects the profitability of farming. For example, transport costs for road haulage of goods are estimated at about USD 6 per tonne per kilometre. Prices of inputs and imports inland are much higher than CIF prices.

## 2.1 Resource endowment

The main components of Kenya's resource base are land, water, fisheries, forestry and minerals.

**Land resources**

Kenya's most important natural resource is its land, which is used predominantly for agriculture. The land is classified broadly into three categories: high, medium and low potential land, based mainly on rainfall (table 1). The high potential areas cover about 13% of the total land area and receive on average more than 857 mm of rainfall annually. The medium potential areas cover about 7% of the land area and have on average 735-857 mm of rainfall per year. The low-potential areas cover about 80% of the total land area and receive on average 612 mm of rainfall or less annually. The high and medium potential areas are

suitable for arable rain-fed agriculture. They are dominated by crop and dairy farming, occupying 31% and 30%, respectively.

**Table 1: Agricultural land in Kenya ('000 ha[a]) and population ('000 persons[b])**

| Region | High potential | Medium potential | Low potential | Other land | Total area | Population (2000 census) |
|---|---|---|---|---|---|---|
| Central | 909 | 15 | 41 | 353 | 1,318 | 3,882 |
| Coast | 373 | 796 | 5,663 | 1,472 | 8,304 | 2,623 |
| Eastern | 503 | 2,189 | 11,453 | 1,431 | 15,576 | 4,841 |
| Nairobi | 16 | – | 38 | 14 | 68 | 2,290 |
| North Eastern | – | – | 12,690 | – | 12,690 | 1,055 |
| Nyanza | 1,218 | 34 | – | – | 1,252 | 4,598 |
| Rift Valley | 3,025 | 123 | 12,230 | 1,515 | 16,883 | 7,386 |
| Western | 741 | – | – | 82 | 823 | 3,532 |
| **Total** | **6,785** | **3,157** | **42,115** | **4,867** | **56,914** | **30,207** |

Notes: [a]1998 estimates
[b]Projections based on 1999 census
*Source: Government of Kenya, CBS, Statistical Abstracts (various)*

The Rift Valley Province has the largest area, population and high and medium potential land for agricultural production. Western and Central provinces have the least area but have proportionately more high-potential land for agriculture. These two provinces are also the most densely populated in the country.

The low potential areas, which are commonly referred to as arid and semi-arid lands (ASALs), are dominated by nomadic pastoralism, utilizing about 50% of their land area, and ranching and other livestock keeping, occupying about 31% of the area. The rest of the land is used for crops, including irrigated farming.

About 75% of Kenyans live in rural areas and are involved in farming. About 6.9 million ha of Kenya's land is arable, and is distributed among smallholdings (3%), medium-size farms (46%) and large farms (15%).

About 3.2 million ha is subdivided into about 3.5 million holdings with an average of 1.2 ha of land per individual ownership. Large holdings occupy about 780 million ha, divided into about 3600 holdings. Therefore, smallholder farmers with less than 1.2 ha of land dominate agricultural production in Kenya.

**Water resources**

Kenya has significant aquatic resources for the supply of water for domestic and livestock use and irrigation. About 330 gazetted water sources serve about 80% of the population. Water availability is a constraint in the low potential areas, which constitute about two thirds of the country. In these areas irrigation is a major source of water for crop and livestock production. However, Kenya's irrigation potential remains largely unexploited. Out of 539,000 ha of irrigable land, which lies mainly along river valleys, only about 87,000 ha is irrigated (GoK, 1992).

**Table 2: Irrigation potential in Kenya**

| Basin | Irrigation potential |
|---|---|
| Tana | 205,000 |
| Athi | 40,000 |
| Lake Victoia | 200,000 |
| Kerio Valley | 64,000 |
| Ewaso Ngiro | 30,000 |
| **Total** | **539,000** |

*Source: Government of Kenya, 1992*

Irrigation schemes may be categorized into public or national, smallholder and private schemes. Development of public irrigation schemes in Kenya started in 1946 when the colonial government established the African Land Development Unit (ALDEV), which focused on irrigation as part of a broad agriculture rehabilitation

programme. In pursuing its objectives, this unit started a number of irrigation schemes, including Mwea and Hola along River Tana, Perkerra along River Kerio and Yatta along Athi River. Later, after independence in 1963 the government developed new schemes at Ahero and West Kano along the Lake Victoria basin and Bura along the Tana River. The public irrigation schemes are managed by the government through the National Irrigation Board, which was established in 1966 through an Act of Parliament (Cap 347) to take over the activities of ALDEV. Table 3 compares irrigation development of these types of schemes by 1998.

**Table 3: Irrigation development in Kenya by 1998**

| Type of scheme | Area (ha) | Crops |
|---|---|---|
| Public | 12,000 | Rice, cotton, horticulture, maize seed |
| Private sector | 23,000 | Coffee, pineapples, horticulture |
| Smallholder | 34,000 | Rice, maize, horticulture |

*Source: Ministry of Agriculture and Rural Development, unpublished reports*

Although Kenya has a large amount of land with irrigation potential, only a small proportion (16%) has been exploited, partly because of the high costs of investment associated with the difficult land terrain, which requires pump-fed irrigation, a costly system compared with gravity irrigation systems. Besides, government funding of new schemes has been discouraged by the poor profitability of existing public schemes and liberalization effects that have forced the government to cut down on support to agriculture.

**Forestry**

Forests occupy about 23% of Kenya's land, and most of the forests are public-owned. The main forest products are wood, timber and animal fodder. Forestry contributes only about 1% of GDP. Because of the limited potential base of forests, Kenya imports substantial quantities of forest products.

**Fisheries**

Fish and fishery products are mainly obtained from marine (saltwater) and freshwater (lakes and rivers) sources. Over the past few years, aquaculture, especially of tilapia, has been growing. The main sources of fish are lakes Victoria and Turkana and the Indian Ocean. The fish industry has become a vibrant part of Kenya's economy, constituting about 1% of GDP. The fish industry is currently one of the fastest growing, non-traditional export sectors and generates both private and public benefits. Production has increased tremendously since independence. Growth in fish export revenue has risen from USD 19 million in 1990 to about USD 96 million in 2000. It is also a major source of employment and food.

**Minerals**

The mining sector accounts for about 0.2% of Kenya's real GDP and contributes about 10% of earnings from merchandise export. Mining activities centre on soda ash, fluorspar and limestone. Other products such as gold and gemstones like ruby and garnet are also mined in limited quantities.

**Human resources**

The population growth rate declined from 4.2% in 1980 to 2.1% in 2000 while in absolute terms it increased from 21.4 million in 1989 to 29.7 million in 1999. The average population growth rate was 3.4% per annum for the inter-census period 1979-1989, and 2.9% per annum during 1989-1999. Unfortunately, domestic food production in the 1990s, estimated at less than 1.5% per annum, did not match population growth. Urban population, which was only about 18% of the total population in 1980, grew to about 25% of the total by 2000. This has implications on agriculture, and particularly calls for increased food production and efficient food marketing arrangements to ensure adequate food supply to urban dwellers. The 1999 population census indicated that over 50% of the population was under 15 years old, meaning that majority of the population was dependent on the working age group of 15-64 years. However, about 14.6% of the people in the working age group are unemployed and about 22.6% are full-time students (GoK 2002). About 74% of the labour force is self-employed in the rural areas, mainly in agriculture and informal off-farm work or in family businesses; the remaining 26% are in wage employment.

## 2.2 Macroeconomic situation

Kenya's gross national per capita income rose from a low of USD 327 in 1980 to a high of USD 389 in 1998, but declined to USD 324 in 2000. The population growth rate declined from 4.2% in 1980 to 2.1% in year 2000. The changes in GNP, per capita GNP and population growth are shown in table 4.

**Table 4: Kenya's GNP per capita and population growth**

| Year | GNP (million USD) (1995 = 100) | GNP per capita (USD) (1995 = 100) | Population growth rate (%) |
|---|---|---|---|
| 1980 | 5,445 | 327 | 4.2 |
| 1985 | 6,152 | 309 | 3.5 |
| 1990 | 7,970 | 341 | 3.2 |
| 1995 | 8,686 | 325 | 2.3 |
| 2000 | 9,777 | 324 | 2.1 |

*Source: World Bank, (2002)*

The main productive sectors of Kenya's economy are agriculture (broadly defined to include forestry and fishing), manufacturing, and services (private and public) sector. The contribution of these sectors to GDP is shown in table 5.

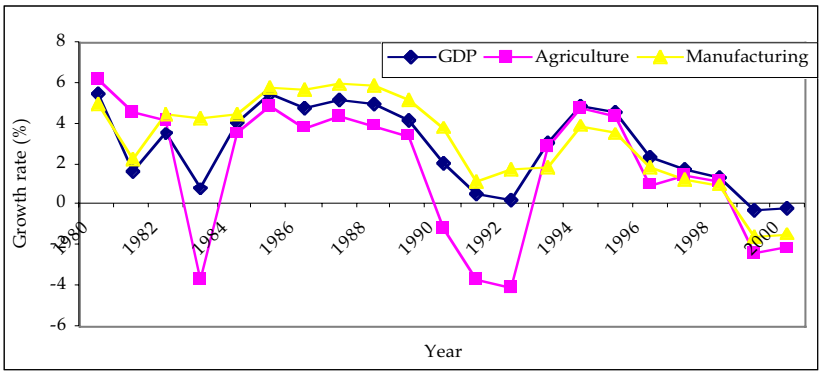
**Table 5: Contribution of various sectors (%) to Kenya's GDP, 1980-2001**

| Sector | 1980 | 1990 | 2001 |
|---|---|---|---|
| Agriculture | 32.8 | 28.2 | 25.9 |
| Manufacturing | 12.8 | 13.4 | 13.1 |
| Services | 55.4 | 58.4 | 61.0 |

*Source: Economic Survey (various)*

The contribution of the agricultural sector declined from 32.8% in 1980 to 25.9% in 2001, while manufacturing stagnated at about 13%. The decline in agriculture is matched by an increase in the share of the services sector, which rose from about 55.4% to about 61% (table 5). The fluctuation of the sectors over the periods was synchronous (figure 1). The growth of agriculture and that of the economy fell in 1982/83, recovered and stabilized during 1984-1989, and fell again in 1990/92 before slightly recovering in 1994. It has been declining since 1995.

**Figure 1: Growth of Kenya's GDP and agriculture and manufacturing, 1989-2000**




Growth of the agricultural sector in the 1980s slowed down largely due to a reduction in donor and public resource investment in the sector. In the 1990s, growth rates were negative in the first three years, averaging –3% for 1990/91 to 1992/93; positive but slow during 1993/94 to 1995/96 (averaging 3%) and positive but low over 1996/97 to 1999/2000, averaging 1.1% per year. A very close relationship exists between growth in the agricultural sector and that of the whole economy. When performance of the agricultural sector is good, that of the economy is good; the converse holds true as well. The positive correlation illustrates the need for the government to invest heavily in agriculture if the economy is to improve.

**Recent performance**

Kenya's economy grew rapidly in the 1960s and 1970s, attaining an average annual growth rate of more than 4%. However, by the mid 1980s severe structural constraints emerged within the economy that prevented the achievement of growth rates attained earlier. Although the oil crisis of the late 1970's were responsible for the poor performance,

other countries that were at the same level of economic development as Kenya and that faced similar external forces emerged from the crisis unscathed due to their sound macroeconomic and structural flexibilities (WTO, 2000).

It was not until 1986 that the government officially spelt out a wide range of policy reforms for the whole economy in Sessional Paper No. 1 on *Economic Management for Renewed Growth* (GoK, 1986). The reforms aimed to reduce government controls, shifting towards increased private sector role in most of activities in the economy. The government was left with the responsibility to control and regulate private participation in the market, guided by forces of supply and demand rather than use of direct interventions.

In the early 1980s the key concern in trade policy reforms under SAPs was liberalization of markets, which had been dominated by government controls. In agriculture, the focus was on eliminating government monopoly in marketing of agricultural commodities, lifting associated price controls and ending government controls on importing, pricing and distribution of farm inputs.

The policy reforms have affected Kenya's economy in several ways. Macroeconomic trends in the 1990s (table 6) indicate low levels of GDP growth. The growth in GDP has been low since 1990 with a general increase from 0.2% in 1993 to a high of 4.4% in 1995. Thereafter GDP growth has been declining, reaching its lowest level of -0.2 in 2000. The low growth rate is attributed partly to the debt burden caused by high domestic borrowing, compounded with periodic fiscal deficits. The domestic debt has also been on the increase, and translated to about 21% of GDP in 2001.

The performance of the exchange rate shows depreciation on nominal terms since 1993. Although the real exchange rate appreciated initially, it started to depreciate from 1999. Public deficit on the other hand

worsened over the period, although international reserves have been on the increase.

Trade performance shows mixed trends with a general increase in export and import indices between 1995 and 1998 and a decline thereafter. The terms of trade worsened against Kenya from 1999.

**Trade and balance of payments**

The nominal value of Kenya's exports rose from K£ 4.2 billion in 1994 to K£ 5.7 billion in 1999, while the value of imports rose from K£ 5.7 billion to K£ 9.9 billion. The policy reforms led to better performance of exports between 1997 and 1998, but performance declined from 1999 (table 6). Growth in imports also declined during the period.

**Development objectives**

The government's development objectives outlined in the *Poverty Reduction Strategy Paper* (PRSP) (GoK, 2001) and the National Development Plans deal with the challenges of economic growth, poverty reduction and employment generation. The major objectives of development are to increase economic growth, enhance productivity and competitiveness, generate employment and reduce poverty. The main impediments to economic growth are unstable macro policies, including unstable exchange rates and fiscal measures; risks and inefficiencies in the financial sector; decreasing and unsustainable real wages at competitive rates; lack of safety nets in taxation, education and health; and unsustainable current account deficits. The key policy strategy to deal with these challenges is to formulate macro policies that provide a stable economic environment that fosters business confidence and encourages 1) vigorous private sector trade and industrial development, 2) mobilization of savings, and 3) availability of investable funds. Other fruitful policies aim to stimulate domestic

**Table 6: Selected macroeconomic indicators, 1992-2000 (USD million)**

| Indicator | 1992 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000[a] |
|---|---|---|---|---|---|---|---|---|
| Real GDP growth rate | -0.8 | 2.6 | 4.4 | 4.1 | 2.1 | 1.6 | 1.3 | -0.2 |
| Consumer prices (change) | 27.1 | 28.9 | 1.5 | 9.0 | 11.2 | 10.6 | 15.0 | 8.4 |
| Nominal exchange rate | 36.2 | 44.8 | 55.9 | 55.0 | 62.6 | 61.9 | 72.9 | 78.0 |
| Real exchange rate | 0.6 | 0.57 | 0.51 | 0.52 | 0.48 | 0.47 | 0.53 | 0.63 |
| Public deficit | 0 | 3.2 | -6.2 | -3.6 | -7.5 | -7.8 | -5.7 | -9.1 |
| International reserves (end of period)[d] | 68 | 148 | 408 | 433 | 497 | 557 | 564 | 746 |
| Exports trade indices (1995 = 100) | 87.5 | 82.9 | 100.0 | 98.5 | 112.8 | 113.7 | 95.3 | 94.9 |
| Imports trade indices (1995 = 100) | 112.6 | 81.0 | 100.0 | 94.1 | 102.7 | 107.7 | 99.9 | 94.9 |
| Terms of trade | 77.7 | 102.0 | 100.0 | 104.0 | 109.0 | 105.0 | 94.5 | 94.5 |

[a] *Provisional*

*Source: World Bank (2002); WTO (2000); CBS, Economic Surveys and Statistical Abstracts*

and external trade, induce technological change to increase productivity, reduce the dominant role of public corporations (parastatals) in favour of private sector enterprises, and encourage development of strategic industries. The country also expects to enhance productivity and competitiveness through proactive regional and international economic integration efforts and export promotion through diversification and value-addition in products to expand Kenya's market share of exports.

The Government of Kenya expects to reduce poverty level by 50% by the year 2015. in accordance with the United Nations (UN) Millennium Development Goals (MDG's). This is to be achieved through provision of basic needs using targeted programmes. The policies to support these programmes focus on improved access to education and health and support to agricultural production to increase access to food for the majority of the poor. The response of the agricultural sector to the policy reforms is yet to be seen and poverty remains a major concern. The average national poverty levels increased from 46.6% of the population in 1982 to about 57% in year 2000.

Food security is a big problem for 50.7% and 38.3% of the rural and the urban population, respectively (GoK, 2000). The government aims to half the incidence of food poverty by year 2015. The strategies for doing so include stimulating growth of the agricultural sector and stabilizing production of food staples. The focus is on improving agricultural productivity and output, stability in the supply and distribution of farm inputs, enhanced employment, and development of social and physical infrastructure for agricultural development.

**Poverty status**

Poverty incidence in Kenya based on the poverty-line approach is shown in table 7. For purposes of international comparison, the poverty line is fixed at income levels of USD 1 per capita per day. Income levels below

the poverty line are insufficient to meet the minimum daily requirements for food, shelter, clothing and transport and other essential non-food items. Poverty is highest in the rural areas as opposed to the urban areas. Rural poverty is marked by its connection to agriculture and land, whereas urban poverty is more heterogeneous in how incomes are generated.

In rural, Kenya the poor depend much more on agriculture than do the non-poor. The distribution of the poor according to regions is shown in table 7. Poverty levels are highest at the Coast, North Eastern and Eastern provinces and the highly populated pockets of Western, Nyanza, Rift Valley and Central provinces. These areas have fewer agricultural opportunities due to their unfavourable climate or, in the case of high potential agricultural areas, have been over-exploited due to population pressure.

Many factors are considered to cause poverty in Kenya; they include low agricultural productivity and poor marketing of agriculture products; unemployment and low wages; inaccessibility to productive assets, particularly land; poor infrastructure; gender imbalance; high costs of social services; bad governance; and HIV/AIDS .

**Food security**

About 75% of Kenya's population lives in rural areas and depends on agriculture for livelihood. Most of the people are concentrated in the high and medium potential areas of central and western Kenya. The main sources of food security for the rural people are subsistence food production and purchases using farm and off-farm income. On the average, 70% of the food consumed by rural households is purchased and 30% is derived from subsistence production. On the other hand, 98% of the food consumed in urban areas is purchased and households produce only 2%. The main sources of farm income are crops and

**Table 7: Poverty incidence estimates in Kenya, 1981-2000**

| Region | 1981/82 | 1992 | 1994 | 1997 | 2000 |
|---|---|---|---|---|---|
| Central | 25.7 | 35.9 | 31.9 | 31.4 | 35.3 |
| Coast | 54.6 | 43.5 | 55.6 | 62.1 | 69.9 |
| Eastern | 47.7 | 42.2 | 57.8 | 58.6 | 65.9 |
| Rift Valley | 51.1 | 51.1 | 42.9 | 50.1 | 56.4 |
| North Eastern | NA | NA | 58.0 | 65.5 | 73.1 |
| Nyanza | 57.9 | 47.4 | 42.2 | 63.1 | 71.0 |
| Western | 53.8 | 54.2 | 53.8 | 58.8 | 66.1 |
| Nairobi | NA | 26.5 | 25.9 | 50.2 | 52.6 |
| Rural | 48.8 | 46.3 | 46.8 | 52.9 | 59.6 |
| Urban | NA | 29.3 | 28.9 | 49.3 | 51.5 |
| National | 46.8 | 46.3 | 46.8 | 52.3 | 56.8 |

NA = not available

*Source: Government of Kenya (2000)*

livestock products that are sold by households. About 50% of the rural farming households are involved in off-farm income-generating activities and about 36% have at least one salary earner living away from the farm. Furthermore, a third of the households receive remittances. Therefore, most rural people depend on farm activities for a significant portion of their incomes. On average, 30% of rural household incomes is derived from farm incomes and 70% from off-farm incomes, including remittances. However, these ratios vary from region to region, with farm incomes constituting a low proportion (18%) in Eastern Province and a high proportion (60%) in Rift Valley Province.

Rising poverty levels and poor performance of the agricultural sector have aggravated the food security situation in the country. The aggregate measures of the country's food security per capita food production, self-sufficiency ratio, ratio of food imports to agricultural exports and ratio of imports to total exports are worse since the reforms started in 1993 than before the reform period (table 8). The indicators show a better food security status between 1986 and 1989, a period during which the government put great emphasis on the development of agriculture

through substantial domestic support measures and some level of protection through quantitative and high tariff level restrictions on imports. However, the food security status deteriorated just after the government committed itself to the implementation of the reforms in 1994. This may be attributed to political and structural economic constraints faced in the country. The implementation of policy reforms in 1993-1994 resulted in recovery and improved status of food security (between 1995 and 1996), but this did not last long; the food security status has deteriorated since then. By year 2000, Kenya was relying more on imports to meet food needs, using about 18% of the value of agricultural exports and 15% of the total value of exports to import food. Food insecurity and poverty in the country may be attributed to the poor performance of agriculture, since this sector dominates the Kenyan economy. The major challenges to the agricultural sector include low farm level productivity, poor marketing and infrastructure, limited access to credit, and high cost of farm inputs. The sector is also subject to lags in development and implementation of policy and an unfavourable legal framework, which are not agreeable to the policy reforms associated with a liberalized economy.

**Employment status**

Unemployment is a major challenge in Kenya. Employment in Kenya is classified into formal (business or economic activities formally recognized and registered by the government) and informal (economic activities not registered with the government, including small-scale agriculture and micro and small enterprises). The formal sector has failed to create adequate employment opportunities as a consequence of slow economic growth and declining levels of investment. The share of various sectors in formal employment is shown in table 9, indicating that agriculture accounted for about 18.5% of the total formal employment in year 2000. During the 1990s, formal sector employment

**Table 8: Indicators of national food security, 1980-2000**

| Year | Per capita food production | Self-sufficiency ratio | Ratio of food imports to agricultural exports | Ratio of food imports to total exports |
|---|---|---|---|---|
| 1980 | 25.4 | 0.74 | 0.21 | 0.09 |
| 1981 | 25.8 | 1.60 | 0.12 | 0.05 |
| 1982 | 25.0 | 1.48 | 0.13 | 0.07 |
| 1983 | 26.2 | 2.13 | 0.09 | 0.06 |
| 1984 | 25.8 | 0.75 | 0.19 | 0.12 |
| 1985 | 25.9 | 1.40 | 0.12 | 0.08 |
| 1986 | 27.0 | 1.45 | 0.11 | 0.07 |
| 1987 | 26.2 | 1.77 | 0.12 | 0.07 |
| 1988 | 25.4 | 2.41 | 0.06 | 0.04 |
| 1989 | 25.7 | 1.57 | 0.11 | 0.07 |
| 1990 | 23.0 | 0.58 | 0.15 | 0.12 |
| 1991 | 23.4 | 1.17 | 0.09 | 0.06 |
| 1992 | 21.4 | 0.54 | 0.21 | 0.16 |
| 1993 | 21.1 | 0.53 | 0.11 | 0.08 |
| 1994 | 20.7 | 0.33 | 0.29 | 0.19 |
| 1995 | 23.6 | 0.97 | 0.09 | 0.06 |
| 1996 | 25.1 | 0.58 | 0.14 | 0.09 |
| 1997 | 19.9 | 0.27 | 0.28 | 0.19 |
| 1998 | 21.0 | 0.36 | 0.22 | 0.15 |
| 1999 | 20.4 | 0.41 | 0.15 | 0.11 |
| 2000 | 15.4 | 0.26 | 0.18 | 0.15 |

*Source: Author's calculation based on data from CBS, Economic Survey (various)*

expanded by only 1.8 % per annum, while the labour force grew by 3.5%.

The informal sector is the main source of employment for the majority of Kenyans. In the 1990s, employment in this sector increased at an annual average of about 10%. However, productivity is low in this sector because it lacks adequate technological skills, credit and institutional support.

**Table 9: Formal sector employment in Kenya, by sector (1992-2000)**

| Sector | 1994 | 1997 | 1998 | 1999 | 2000 |
|---|---|---|---|---|---|
| Agriculture, forestry and fishing | 18.7 | 18.6 | 18.5 | 18.6 | 18.5 |
| Mining and quarrying | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 |
| Manufacturing | 13.1 | 13.0 | 13.0 | 13.1 | 13.0 |
| Services | 61.5 | 61.9 | 62.0 | 61.9 | 62.1 |

*Source: Compiled from Kenya Economic Survey (various)*

# 3. Overview of Policy Reform Experience and Performance of the Agricultural Sector

This section provides an overview of the policy reform experience and performance of the agricultural sector in order to lay the foundation for analysis of the impact of the reforms on the sector and national and household food security levels.

## 3.1 Policy reform experience

The policy reforms were first detailed in the Sessional Paper 1 of 1986 on '*Economic Management for Renewed Growth*' (GoK, 1986). These included monetary and fiscal policy reforms, price decontrol on all commodities, removal of import licensing and foreign exchange controls, abandonment of import substitution, adoption of outward-oriented policies and privatization of public enterprises. Kenya also dismantled its quantitative import restrictions and price controls on major products, leaving tariffs as the main trade policy instrument. The tariff structure and incentive schemes were rationalized. Several public enterprises were restructured and the influence of most agricultural boards reduced. The various policy reforms are discussed below.

**Macroeconomic policy reforms**

Macroeconomic policy reforms comprised mainly monetary and fiscal policies.

**Monetary policy reforms**: The government has relied on three instruments of monetary policy: stopping unsecured credit to commercial banks, raising the cash ratio, and enhancing the sale of treasury bills to control money supply. However, in 1996 the Central Bank of Kenya (CBK) Act was amended to grant CBK statutory independence. In addition, comprehensive measures were taken to

improve the effectiveness of monetary control instruments (maturity of treasury bills, daily cash ratio requirements, banks' flexibility to reduce fluctuations in inter-bank interest rates, and elimination of interest paid to banks on excess of bank balances). These reforms came with the requirement that ceilings on loan interest rates must include all lending-related charges and fees removed, permitting institutions to set their lending rates to reflect current market conditions. The monetary policy has affected credit availability in the economy. Evidence indicates the presence of strict monetary policy with most of the credit going to the government and parastatals, which limits the volume of credit available for private sector development (Ndung'u, 1997).

**Exchange rate reforms**: The main reforms that led to liberalization of the foreign exchange system started in 1993. Before these reforms, all foreign exchange transactions were referred to CBK. In 1993, the foreign exchange system was liberalized, allowing commercial banks to effect foreign payments for their private clients without referring to the CBK. The Kenya shilling was allowed to float freely. Other reforms in the foreign exchange policy in the 1990s included introduction of retention schemes permitting exporters to retain all of their foreign exchange earnings.

Trends in foreign exchange rates of the Kenya shilling to the US dollar for 1965 to 2001 indicate that nominal exchange rates have generally depreciated, with the highest annual increases occurring in 1992/1993. The real exchange rate also shows a general declining trend (appreciation of the Kenya shilling) until 1998 after which the trend reversed. This appreciation of the shilling could have contributed to the slow growth of the Kenyan economy, although Ndung'u (1997) argues that the growth of real productive sectors of the economy has been contracting due to liberalization and short-term reallocation of resources. According to the CBK, appreciation of the Kenya shilling was as a result of the substantial increases in the supply of foreign

exchange reserves with a subdued demand for foreign exchange on account of the relatively low level of economic activity. The main concern about the foreign exchange policy relates to need for a stable policy to support agricultural development by reducing uncertainty in the sector. The floating exchange rate, with its instability and uncertainty, seems to be hurting the Kenyan economy.

**Fiscal policies**: Fiscal policy reforms, just as is the case with other reforms started during the 1980-1984 period with a sharp deflation through reduction of the budget deficit (4%), import compression, tight monetary policy and a decline in public investment. A budget rationalization programme was introduced in 1985 to increase operations and maintenance expenditure and prioritize investment expenditure. The government has over time strived to reduce the budget deficit using instruments to reduce government expenditure and increase tax collection. However, this has not been possible and the budget deficit has continued to grow over the years. In recent years, the government has used workers' retrenchment programmes in the public sector to reduce the deficit, but servicing the public debt is a major problem for the economy. The total debt to GDP ratio is about 80%. This limits the government's capacity to invest in productive services, such as agricultural development.

**Trade policy reform**

Trade policies have a major impact on agriculture because Kenya's external trade is mainly dependent on agriculture. Trade policies before the introduction of market liberalization efforts in the 1980s were geared towards domestic protection with the overall objective of encouraging import substitution and government revenue generation. The instruments used to achieve these objectives included licensing of importers, quantitative restriction on imports, and high tariffs and bans

on exports and imports. The policy reforms adopted in the Sessional Paper No. 1 of 1986 focused on moving towards a more outward-looking trade regime with a reduction of restrictive trade policies, strengthening of market access for Kenyan exports abroad and further integration of the Kenyan economy into the world economy. Implementation of these policies was strengthened in 1993.

**Tariff levels**: As part of the market liberalization efforts, removal of quantitative restrictions and reduction in tariffs started in 1980, and by 1991 the protection of commodities through quantitative restrictions was only for reasons of health and public safety. All the other items were automatically licensed. There has been a policy to harmonize the structure and reduction of tariff levels. As a result, average tariff rates, both weighted and unweighted, have also fallen since 1990. The import-weighted tariff was reduced from 30% in 1984/1985 to 23% in 1991/1992 and to about 18% in 1999. The tariff dispersion was lowered and the number of tariff bands reduced from seven in the 1980s to only three in 2001. The highest tariff level decreased from more than 70% in the 1980s to 35% in 1999.

On becoming a member of WTO, Kenya bound its tariffs at 100% for all agricultural products and 62% for fish. It also committed itself to eliminating all non-tariff barriers on agricultural imports. The tariff levels have since been substantially reduced from between 40% and 60% for most commodities to below 35% for most of the agricultural commodities and processed products. The tariff levels have never reached the bound ceilings set, although the suspended duties are sometimes reintroduced when there is need to protect the industry. This has been done for sugar, for which the tariff rate plus the reintroduced suspended duties were 100% in 2001. The use of suspended duties was necessary to reduce the level of sugar imports, which were considered to be cheaper than locally produced sugar.

**Non-tariff barriers to trade:** The non-tariff barriers used in Kenya mainly relate to customs procedures, import prohibitions and licensing, anti-dumping regulations, and use of standards. Customs procedures require that imports into Kenya of a free-on-board (FOB) value of USD 5000 or more be subject to a compulsory quality inspection and price comparison. If the goods are suspected to be under-valued, the importer is asked to produce certified invoices, which are verified against catalogues or similar units or quantities. A penalty of 10% (20% for motor vehicles) of the FOB value is charged if merchandise normally subject to pre-shipment inspection (PSI) is shipped without inspection. A PSI fee is included in the import declaration fee of 2.75% payable on all imports to Kenya irrespective of their value.

Kenya abolished its import-licensing regime for all goods in 1993, but a negative list of products subject to import prohibition, restriction and control exists only for moral, health, security and environmental reasons, and under international conventions. The country applies no trade sanctions either nationally or internationally, except those endorsed by the United Nations Security Council, the Organization of African Unity (OAU), the Common Market for Eastern and Southern Africa (COMESA) or other regional organizations in which it is a member. Anti-dumping and countervailing measures are provided for under sections 125 and 126 of the Customs and Excise Act. A dumping duty may be imposed on dumped or subsidized goods if their importation threatens to cause material injury to an established industry, or materially retard the establishment of an industry in Kenya.

Kenya's standards, which are developed by the Kenya Bureau of Standards (KEBS), follow international norms. The standards are compulsory and apply equally to imports and locally produced goods. KEBS tests and inspects products, randomly checks imports to ensure conformity to national standards, and issues certificates.

The inspection fee is 0.211% and 0.1% of the value (the cost insurance and freight (CIF) value of imports or the sale price of locally produced goods) of finished products and raw materials, respectively. Infringement of provisions of the KEBS Act may lead to confiscation or prohibition of manufacture or sale of goods. Infringees are liable to a fine not exceeding Ksh 10,000, imprisonment for a term not exceeding 12 months, or both. The minister of trade and industry may exempt goods from compliance with a compulsory standard on a case-by-case basis.

Kenya has no national rules on origin of goods, but rules of origin exist for preferential treatment purposes in trade agreements to which Kenya is a signatory. The country has adopted the COMESA rules of origin, which stipulate that for the final product to be considered of particular importance for the economic development of a member state, the product must wholly be produced, contain imported content of not more than 60% CIF value of the total cost of materials used in its production, contain less than 45% ex-factory added value, or contain not less than 25% added value. All goods eligible for preferential tariff treatment must be accompanied with a COMESA certificate of origin, stamped and authenticated by the authorized signatories in the country of origin.

**Export subsidies and incentives**

Before the reforms, Kenya used a number of schemes to support domestic production. Some of these were continued into the reform period. These schemes focused on manufacturing and not primary agricultural production. The three approaches widely used are compensation schemes, export processing zones (EPZ) and manufacturing under bond (MUB). The compensation schemes provided for compensation on duties (value-added tax and duty) on imported inputs on the basis of export performance. This scheme had

existed since 1974 but was phased out in 1993 and replaced with remission and refund of import duties, with import duties on some specific products partially or wholly remitted. The remissions and refunds were provided for imports for use in the production of manufactured goods for export or for the production of raw materials.

The EPZ scheme provides tax exemptions and tax holidays for investors. A 10-year income-tax holiday and a rate of 25% instead of the normal 30% and 37.5% for resident and branches of non-resident companies, respectively, are provided. However, imported goods from such companies are subject to import duties if sold in the domestic market. Investment allowances with deductions of up to 60% are provided in the manufacturing and the hotel sectors. Under MUB, a refund is made of VAT paid on inputs used in business activities or registered companies. Other incentives in production are VAT zero-rating for inputs for healthcare, education and agricultural products. However, like many other developing countries, Kenya does not subsidize any of its exports of goods or services. Although the compensation, EPZ and MUB schemes targeted manufactured goods, they had indirect effects on agriculture, since some manufactured goods use agricultural products as raw materials.

**Agricultural sector policy reforms**

Like all the other sectors of the economy, agriculture was affected by policy reforms of the 1980s. Before the reform, period production and marketing of most commodities from smallholders were organized under cooperative societies, whose main function was procurement of production inputs and marketing of outputs. State-run farmer organizations were also set up to support production and marketing of major commodities. These included the Kenya Tea Development Authority (KTDA), Kenya Cooperative Creameries (KCC) for milk,

National Cereals and Produce Board (NCPB), National Irrigation Board (NIB) for irrigated crops and Horticultural Crops Development Authority (HCDA). State boards regulated production and marketing of all important commodities. These boards included the Sisal Board of Kenya, Pyrethrum Board of Kenya, Kenya Sugar Authority, Coffee Board of Kenya, Tea Board of Kenya, Pyrethrum Board of Kenya, Kenya Dairy Board, Cotton Board of Kenya and Kenya Meat Commission.

The farmers' cooperatives, the state-run farmers' organizations and the boards dealing with food crops in particular did not achieve their objectives. For example, one of the responsibilities of NCPB was to ensure price stabilization and food security in cereals. This objective was not always realized because operational costs were high and there were managerial problems in the board that led to inefficiencies in delivery of services to farmers and delays in and unreliability of payments. As a result, prices in areas producing surplus maize often fell below expected government-controlled prices while those in deficit areas often rose above the expected prices.

The key concern in trade policy reforms in the early 1980s under SAPs was to liberalize markets, which were dominated by government controls. In agriculture, the focus was on removing government monopoly in marketing of agricultural commodities, lifting associated price controls and ending government control on importing, pricing and distribution of farm inputs. The main trade and agricultural policy reforms are shown in table 10.

As shown in table 10, most policy reforms have been implemented. Although the policy reforms have helped to bring about macroeconomic change in general, they have been less successful in stimulating growth in the agricultural sector. Complementarity among policies and proper sequencing of implementation are often missing in reform measures. For example, there is no institutional framework for efficient operation

**Table 10: Specific policy changes for various agricultural commodities**

| Commodity | Policy before change | Policy after change | Date of change in policy | Implement-ation status |
|---|---|---|---|---|
| Coffee and tea | Auctioning marketing and no retention of foreign currency proceeds by exporters | Auctioning using foreign currency and retention of proceeds by exporters | November 1992 | Completed, 1995 |
| Sugar | Producer prices controlled and control of imports | Minimum prices established<br><br>Variable duties used to protect local producers | 1994<br><br>1994 | Done, 1994 |
| Maize | NCPB only importer and controller of producer and consumer prices<br><br>NCPB maintained strategic reserves | Private sector to import but variable duty imposed and minimum (floor) prices based on NCPB prices<br><br>Foreign exchange reserve of USD 60 million established | 1992<br><br>1994 | Done, 1993<br><br>Varies annually |
| Wheat | Producer prices controlled and NCPB only importer | Minimum (floor) prices based on long-term import parity prices and imports controlled using variable duties | 1994 | Done, 1993 |
| Milk and dairy products | Price controls and KCC monopoly in processing and marketing<br><br>Kenya Dairy Board a monopoly for imports | Prices decontrolled and private sector participation in processing and marketing<br><br>Liberalized imports but duties to control imports | 1992<br><br>1992 | Done, 1993<br><br>Done, 1993 |
| Cotton | Domestic marketing, trade, and prices controlled | Complete deregulation of domestic marketing and pricing | 1992 | Done, 1993 |

*Source: Nyangito (2001)*

of markets or a system of rights and obligations to knit society together and respond to citizen needs. Kenya seems to have equated liberalization and privatization with abdication of responsibility for economic development. Years of government monopoly in production and marketing hindered private entrepreneurs from acquiring managerial skills or the financial capacity to take over, and the physical infrastructure was not adequately developed to handle private investment. These factors may have affected the response of the agricultural sector to policy reforms.

**Research and extension**

Research and extension in Kenya are dominated by the Kenya Agricultural Research Institute (KARI), a parastatal established by an Act of Parliament in 1979 to undertake research in agricultural disciplines. Although Kenya's agricultural research system is strong, lack of progress in increasing total factor productivity in agriculture suggests that it is has not led to high yields on farms because of weaknesses in technology development and transfer. This has been attributed to weaknesses in priority setting, financing, management and inter-agency linkages. In addition, financing imbalances have affected research efforts. Recent analysis (Oluoch-Kosura, 2002) shows a declining trend in efficiency and effectiveness of the Ministry of Agriculture's extension services. This may be due to the declining budgetary allocation to the sector, lack of clear objectives, failure to identify the role of the beneficiaries and poor definition of organizational and institutional structures.

**Agricultural credit**

Before market liberalization, formal agricultural credit was provided at subsidized rates through the Agricultural Finance Corporation (AFC).

However, this parastatal had difficulties recovering loan advances and had to stop lending at subsidized rates. AFC's lending rates have remained lower than commercial rates and are more stable. Although banks are legally required to lend between 17% and 20% of their loan portfolio to the agricultural sector, the local banking system has remained conservative in lending to agriculture, probably owing to risks in agricultural production. The situation has been worsened by liberalization of interest rates and lending policies, making it difficult for small-scale farmers to access credit. On average, credit to agriculture is estimated at less than 10% of the total credit provided through the domestic financial system.

The bulk of agricultural credit goes to meet short-term needs. Term lending to private agriculture investment amounts to approximately 3% of agricultural GDP. It is estimated that smallholder producers receive only one-third of the total rural credit, with the bulk going to large-scale farmers. Smallholder farmers, and particularly female farmers, are at a distinct disadvantage. Although women comprise 70–80% of the agricultural workforce, their access to rural credit through the financial system is negligible. Most rural women have neither off-farm employment nor title to land, which are a requirement for short-term lending, and are therefore ineligible for credit. Some credit is provided to women through NGO-managed schemes, 'merry-go-rounds' and from friends. However, these amounts are relatively small compared with what could be productively absorbed by female agriculturalists.

**Input policy reforms**

Prior to market liberalization the government controlled input marketing through price controls, import licensing and quotas, and subsidization of some inputs such as fertilizers, improved seed,

pesticides, vaccines, machinery and artificial insemination services. The reforms have liberalized input markets and the country has developed a network of markets for agricultural inputs such as chemical fertilizers, seed, livestock feeds, artificial insemination services and agrochemicals. The main problem with liberalization of the input market is quality assurance. Farmers have occasionally been sold low quality seed, fertilizer or pesticide. In addition, only a few large-scale and plantation enterprises can afford to use high levels of purchased inputs. The situation is worsened by lack of credit to procure inputs. However, in cases where credit is offered in kind, for example in tea and sugarcane production through processing and marketing agencies, farmers have been known to divert fertilizers to other uses. Fertilizer use is still low because of the high prices charged by the few companies and distributors involved in its marketing, underdeveloped supply channels and a weak extension service that has failed to create awareness among farmers on the right types of fertilizers for particular crops, methods of application, application rates and benefits from using fertilizers.

**Food security policies**

Food security is of paramount importance in Kenya's development policy. This is strongly implied by the food policy document (GoK, 1981) and its revised version (GoK, 1994), the consecutive five-year development plans and the Poverty Reduction Strategy Paper (GoK, 2002). The objective of the food policy is to ensure food self-sufficiency to help keep the nation fed without using the scarce foreign exchange resources on food imports. This objective was the rationale behind the government's long-pursued agricultural policies such as those that supported input subsidies and controlled marketing of food commodities.

The NCPB had the monopoly to market all cereals, to import food whenever there were deficits and to export surpluses. This board was also mandated to guard against food insecurity by maintaining strategic reserves of foodstuffs, particularly maize, which would be released to the market during grain shortages. With liberalization, the NCPB monopoly in trade of food commodities was dismantled leaving the board in the market as a commercial buyer and seller of last resort. However, the board is still responsible for maintaining strategic food reserves, supported by a foreign exchange reserve of USD 60 million, which was established to guard against food shortage. With these funds NCPB purchases food during shortages or from farmers during glut periods.

**External shocks**

The external shocks that affected agricultural production both before and after the policy reform periods are mainly associated with climate conditions. Droughts such as those that occurred in 1980, 1984, 1994 and 1999 are often a major factor in agricultural production. This is particularly so because of Kenya's dependency on rain-fed agriculture. Excessive rainfall such as the El Niño rains of 1997 that destroyed infrastructure, making marketing of produce difficult, also affects agricultural production negatively.

Another factor that has influenced the Kenyan economy was restricted donor financing witnessed between 1991 and 2002. The government's failure to honour political governance and economic management pledges made to the World Bank and IMF led these institutions to stop aid and lending to the country, therefore creating financial constraints in implementation of development programmes. Other donors followed in the World Bank and IMF steps and restricted lending to Kenya from 1993, affecting the performance of the economy including agriculture.

## 3.2 Agricultural structure

This section provides an overview of the agricultural sector and its performance over time.

**Production structure**

The major agricultural commodities produced in Kenya are food crops, industrial and export crops, horticultural products and livestock and livestock products. The main tradable food crops are maize, wheat and rice, while the non-tradables comprise sorghum and millets, pulses (beans and peas) and roots and tubers (cassava, sweet potatoes, Irish potatoes and yams). The most important industrial crops in Kenya are sugarcane, cotton, sisal and pyrethrum. Others are tobacco, cashew nuts, wattle trees and a wide range of oil crops. These are produced for use by industries in agroprocessing, although some are exported as raw materials.

**Export crops**

Coffee, tea and horticultural crops are the main sources of foreign exchange, employment and income for many large- and small-scale farmers in Kenya. These three commodities jointly contribute about 34% of the agricultural GDP, employ over 40% of the agriculture labour force and contribute over 60% of the foreign exchange earnings.

**Livestock**

Kenya's herd of livestock is diversified. Livestock contribute about 40% of agricultural GDP. Dairy production, which is dominated by smallholders, uses more land than any other single agricultural enterprise, accounting for about 47% of the high and medium potential

land. The demand for milk continues to rise rapidly but supply does not keep pace, especially in the dry months. Red meat (beef and small ruminant meat) constitutes about 70% of the meat consumed in the country. Production is estimated at about 252,000 t for beef, 62,000 t for goat and 37,000 t for sheep meat. Beef, goats, sheep and camels are mostly produced in the ASALs. Poultry and pork are also important sources of meat.

**Farming structure**

The farming population encompasses both small- and large-scale operators. Small-scale farmers have land sizes of less than 2 ha. There are about 3 million smallholder farms in Kenya, 80% of whom have less than 2 ha, with women providing the bulk of the labour and heading about a third of the households. Small-scale farms account for over 75% of the total agricultural production and their share of marketed production has been increasing since 1980. The increasing role of smallholder farmers is an indication of their growing importance in the total marketed production. In addition, smallholder farmers account for the production of about 70% of maize, 65% of coffee, 50% of tea, 80% of milk, 70% of beef and other meats, and over 80% of the production of pyrethrum and cotton (Argwings Kodhek *et al*, 1998).

## 3.3 Review of aggregate agricultural performance

This section focuses on the production and trade performance of the agricultural sector.

**Agricultural production**

Agricultural production during 1980-2000 shows mixed trends for various commodities (figures 2 and 3). Most commodities, particularly food and industrial crops, show a decline in production in recent years. The worst decline occurred for maize, rice, milk, cotton, sisal and coffee (figures 2 and 3).

The performance of the whole agricultural sector in the 1990s was dismal with annual growth in agricultural GDP averaging 2% compared with an average of 4% in the 1980s. Past growth in the sector can be categorized into two distinct phases (Kariuki, 2001): pre- and post-

**Figure 2: Domestic production of food crops, 1980-2000**

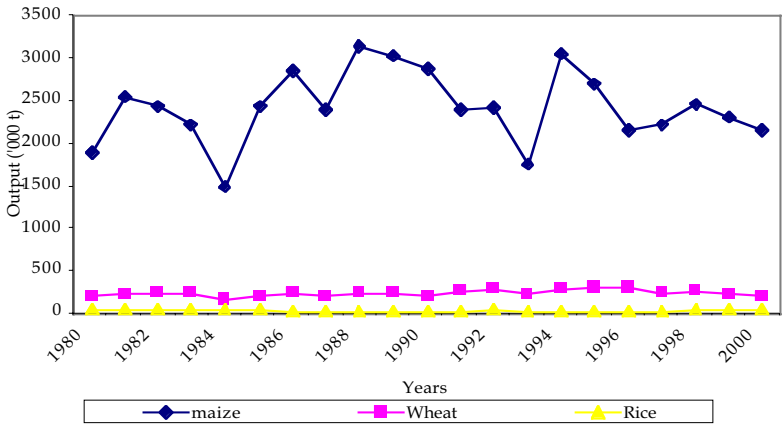
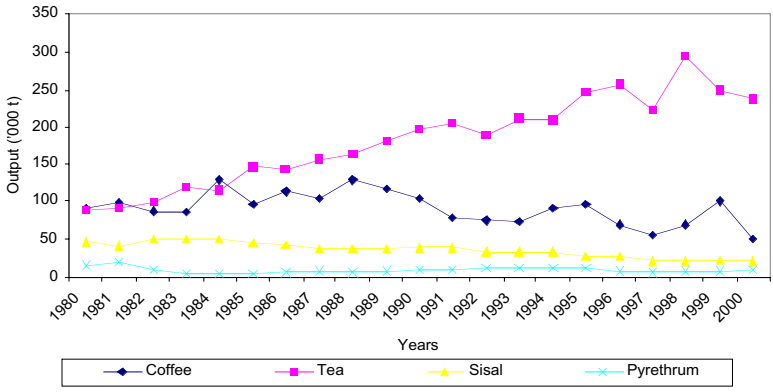



**Figure 3: Domestic production of industrial crops, 1980-2000**



reforms periods. Growth in 1963–1980 was characterized by heavy government and donor involvement through subsidization of services and inputs such as artificial insemination (AI), fertilizers, disease control, extension and marketing infrastructure. This was not sustainable, and since 1980 the sector has faced major crises arising from scarcity of funds, fluctuations in international prices and inflation that have caused declines in growth rates, which plummeted to all time low in the late 1990s. During 1980–1990, the sector had an average annual growth rate of 3.5%. This impressive performance was attributed to three main factors: area expansion, use of improved production technologies, and a sound extension system. The performance of the sector has deteriorated in recent years, averaging about 2% during 1994–2000. The low growth rate has changed Kenya from being self-sufficient in most basic staples to a net food importer. The poor performance of the sector, and therefore the general economy, is manifested by widespread poverty in the rural population.

**Agricultural trade performance**

The following section provides an account of the trend in agricultural exports and imports.

**Exports**: Agricultural commodities dominate Kenya's exports, while manufactured goods dominate imports. Agriculture's share in export earnings has averaged 55% over the past 10 years. Tea, coffee, pyrethrum and horticultural products dominate agricultural exports (table 11). Coffee dominated exports until 1988 when it was overtaken by tea. In 1998 horticultural crops overtook coffee to become the second most important agricultural export for Kenya. Except for tea and crude vegetable materials, the performance of traditional exports was poor in the 1990s with growth averaging 7.4% compared with non-traditional exports where growth was estimated at 20.1% (Mwega, 2000). The good

performance of non-traditional exports is attributed to the removal of restrictive trade policies by importing countries, particularly Europe, under the African Caribbean Pacific-European Union (ACP-EU) Lome Agreement. The good performance in 1992-1996 overlaps with trade liberalization and is attributed to the "removal of bureaucratic bottlenecks and availability of foreign exchange" (GoK, 1996).

**Imports**

Agricultural imports are dominated by food items, particularly cereals and dairy products (table 12). The levels of food imports for most commodities were low between 1987 and 1991, since food from domestic production almost matched domestic consumer needs. However, imports have been high since 1992 as a consequence of the decline in domestic production. The fluctuations in import levels are a reflection of fluctuations in domestic production. The largest amounts of food imports are from developed countries (EU, USA and Australia). Food production in these countries is highly subsidized, which poses a threat to domestic production of food commodities. This is particularly so when the imports dampen domestic producer prices, therefore reducing incentives to producers. However, cheap imports may allow consumers to access food cheaply.

**Table 11: Quantity of agricultural exports ('000 t)**

| Commodity | 1985 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Coffee | 104.7 | 98.0 | 114.4 | 84.1 | 78.1 | 88.3 | 76.9 | 88.5 | 116.7 | 68.2 | 50.7 | 69.7 | 87.0 |
| Tea | 126.3 | 163.3 | 166.4 | 175.6 | 166.5 | 188.4 | 174.9 | 217.9 | 262.1 | 199.2 | 263.8 | 260.2 | 217.3 |
| Canned pineapples | 44.5 | 61.3 | - | 71.5 | 67.5 | 67.3 | 67.8 | 75.0 | 92.0 | 71.0 | 79.3 | 51.6 | 56.2 |
| Hides & skins (undressed) | 10.5 | 10.2 | 1.1 | 12.7 | 0.4 | 0.7 | 2.7 | 2.2 | 2.3 | 2.6 | 2.1 | 7.3 | 7.6 |
| Sisal | 40.0 | 32.9 | 30.1 | 27.7 | 32.0 | 27.3 | 25.4 | 21.2 | 21.7 | 19.2 | 17.6 | 16.8 | 16.8 |
| Pyrethrum products | 0.7 | 0.5 | 0.5 | 0.4 | 0.3 | 0.3 | 0.4 | 0.4 | 0.6 | 0.4 | 0.3 | 0.6 | 0.2 |
| Meat products | 3.7 | 0.4 | 1.6 | 2.1 | 0.4 | 0.7 | 0.9 | 1.1 | 1.2 | 1.2 | 1.3 | 1.2 | 1.3 |
| Butter & ghee | 0.3 | 0.3 | 0.4 | 0.05 | 0.08 | 0.1 | 0.07 | 0.2 | 1.6 | 0.2 | 0.2 | 0.07 | 0.03 |
| Sugar and products | 37.0 | 0.0 | – | – | – | – | – | – | 7.5 | 10.4 | 9.2 | 8.6 | 13.3 |
| Cotton (raw) | 1.7 | 0.0 | – | – | – | 0.004 | – | 1.0 | – | 0.08 | 0.09 | 0.05 | 0.2 |
| Wool (raw) | 0.7 | 0.4 | – | 0.02 | 1.0 | 0.4 | 0.3 | 0.3 | 0.3 | 0.4 | 0.2 | 0.06 | 1.2 |
| Maize (unmilled) | 17.7 | 110.2 | 159 | 18.7 | 0.4 | 0.1 | 1.7 | 154.3 | 221.5 | 2.6 | 9.1 | 30.5 | 0.5 |
| Animal feeds | 9.7 | 11.2 | 7.9 | 34.7 | 14.2 | 13.4 | 12.3 | 11.0 | 2.1 | 0.7 | 0.7 | 0.8 | 0.6 |
| Live animals ('000) | 62.1 | 366 | 183 | 101 | 140 | 529.2 | 961.3 | 1254 | 636.6 | 667.7 | 2024 | 1590 | 1250 |

*Source: Statistical Abstracts (various)*

**Table 12: Imports of major food commodities, 1980-000 ('000 t)**

| Year | Maize | Wheat | Rice | Sugar | Dry milk |
|---|---|---|---|---|---|
| 1980 | 323.0 | 48.5 | 1.2 | 3.1 | 12,888 |
| 1981 | 77.3 | 49.2 | 4.6 | 2.1 | 11,210 |
| 1982 | 89.0 | 139.3 | 11.9 | 2.2 | 4,210 |
| 1983 | 0 | 81.9 | 44.8 | 2.4 | 4,532 |
| 1984 | 405.4 | 149.9 | 0.5 | 1.7 | 11,108 |
| 1985 | 125.5 | 14.8 | 0.6 | 39.1 | 6,677 |
| 1986 | 0.7 | 115.3 | 61.7 | 126.3 | 1,508 |
| 1987 | 0 | 217.9 | 39.2 | 49.1 | 545 |
| 1988 | 0 | 75.6 | 10.0 | 42.0 | 82 |
| 1989 | 0 | 123.5 | 30.0 | 80.0 | 15 |
| 1990 | 0 | 322.6 | 28.0 | 64.0 | 48 |
| 1991 | 0 | 242.6 | 61.2 | 59.7 | 65 |
| 1992 | 414.9 | 100.8 | 58.9 | 153.8 | 829 |
| 1993 | 12.9 | 314.4 | 37.2 | 184.8 | 747 |
| 1994 | 650.4 | 353.1 | 93.5 | 256.1 | 2,319 |
| 1995 | 12.0 | 364.0 | 30.7 | 244.0 | 679 |
| 1996 | 10.8 | 486.9 | 47.9 | 65.8 | 309 |
| 1997 | 1,101.1 | 388.1 | 62.4 | 52.4 | 863 |
| 1998 | 774.0 | 478.9 | 62.8 | 186.5 | 2,500 |
| 1999 | 73.5 | 579.0 | 53.4 | 55.6 | 2,694 |
| 2000 | 409.4 | 636.0 | 105.8 | 91.6 | 1,749 |

# 4. Impact of Policy Reforms on Agricultural Production, Prices and Trade

This section presents an analysis of the impact of policy reforms on domestic supply, price and trade response on the agricultural sector.

## 4.1 Price analysis

The prices paid to farmers for produce are an indication of market performance, since they are a major incentive for production. Real prices received by farmers for various commodities are shown in tables 13-15. The base year for the real price estimation is 1982. The trends show that prices fluctuated and that price instability for food and industrial crops was more pronounced during the 1990s than the 1980s. The price instability may be attributed to liberalization with its domestic policies (such as elimination of trade constraints) and world market price changes.

**Table 13: Average real prices per tonne of food crops, 1980-2000**

| Year | Maize (Ksh/t) | Wheat (Ksh/t) | Rice (Ksh/t) |
|---|---|---|---|
| 1980 | 1,263 | 2,180 | 2,007 |
| 1981 | 1,189 | 1,986 | 1,784 |
| 1982 | 1,070 | 1,880 | 1,500 |
| 1983 | 1,364 | 1,966 | 1,576 |
| 1984 | 1,463 | 2,249 | 1,488 |
| 1985 | 1,391 | 2,015 | 2,544 |
| 1986 | 1,458 | 2,158 | 1,563 |
| 1987 | 1,441 | 2,034 | 2,265 |
| 1988 | 1,386 | 2,202 | 2,512 |
| 1989 | 1,295 | 1,987 | 2,254 |
| 1990 | 1,537 | 2,642 | 1,427 |
| 1991 | 1,463 | 2,393 | 766 |
| 1992 | 1,619 | 1,911 | 399 |
| 1993 | 2,017 | 1,407 | 1,307 |
| 1994 | 2,065 | 2,609 | 1,976 |
| 1995 | 1,626 | 2,643 | 2,086 |
| 1996 | 1,966 | 2,913 | 2,988 |
| 1997 | 2,351 | 3,030 | 2,735 |
| 1998 | 2,043 | 2,688 | 3,354 |
| 1999 | 2,064 | 2,703 | 3,292 |
| 2000 | 2,022 | 2,305 | 3,251 |

*Source: Statistical Abstracts (1995-2001) and authors' calculation*

Real prices of food crops generally increased during the 1990s (post-liberalization period) possibly because the liberalization of the domestic trade regime eliminated restrictions on maize marketing. The price variability for industrial crops was higher during the 1990s, perhaps because the prices of industrial crops are determined by the derived demand for the processed products, which faced stiff competition from outside. The fluctuating supply of imports of agro-processed products of industrial crops (e.g. textiles and sugar) affects the demand for Kenyan processed products, and therefore results to price fluctuations for processed products according to the supply of imports.

**Table 14: Average real prices of industrial and export crops, 1980-2000 (Ksh/t)**

| Year | Tea | Coffee | Sugarcane |
|---|---|---|---|
| 1980 | 21,151 | 35,017 | 177 |
| 1981 | 21,101 | 26,859 | 172 |
| 1982 | 19,410 | 27,800 | 170 |
| 1983 | 19,341 | 30,889 | 201 |
| 1984 | 43,334 | 32,132 | 190 |
| 1985 | 20,033 | 29,540 | 201 |
| 1986 | 24,908 | 36,972 | 219 |
| 1987 | 17,235 | 25,246 | 207 |
| 1988 | 13,190 | 28,911 | 232 |
| 1989 | 15,783 | 25,048 | 214 |
| 1990 | 20,675 | 21,351 | 263 |
| 1991 | 18,420 | 22,279 | 249 |
| 1992 | 9,975 | 14,141 | 136 |
| 1993 | 23,007 | 24,610 | 206 |
| 1994 | 19,016 | 31,365 | 338 |
| 1995 | 13,797 | 32,458 | 316 |
| 1996 | 14,740 | 25,934 | 289 |
| 1997 | 18,281 | 43,050 | 266 |
| 1998 | 21,151 | 40,900 | 275 |
| 1999 | 18,618 | 23,283 | 258 |
| 2000 | 21,240 | 16,058 | 281 |

*Source: Statistical abstracts (1990-2001) and authors' calculation*

The mixed trends in prices of export crops may be attributed to instability in world market prices of these crops. Since the crops are produced for the export market, their domestic prices depend on world market conditions. The trends in world market prices shown in table 15 are mixed. The prices of coffee are unstable and show a mixed but generally declining trend, while those of tea demonstrate an increasing trend during the post-reform era.

**Table 15: Average commodity world market nominal prices (USD/t)**

| Year | Maize | Wheat | Rice | Coffee | Tea |
|---|---|---|---|---|---|
| 1990 | 120.1 | 159.2 | 287.4 | – | – |
| 1991 | 123.0 | 168.0 | 314.4 | – | – |
| 1992 | 116.8 | 200.1 | 287.4 | – | – |
| 1993 | 107.6 | 207.4 | 269.7 | 1,540 | 1,850 |
| 1994 | 129.5 | 242.3 | 357.4 | 3,270 | 1,830 |
| 1995 | 153.8 | 277.1 | 327.8 | 3,290 | 1,640 |
| 1996 | 183.5 | 238.6 | 349.3 | 2,650 | 1,770 |
| 1997 | 134.6 | 191.5 | 303.9 | 4,100 | 2,400 |
| 1998 | 116.7 | 178.0 | 303.9 | 2,900 | 2,400 |
| 1999 | 110.2 | 165.5 | 270.9 | 2,280 | 2,090 |
| 2000 | 109.7 | 162.4 | 202.4 | 2,030 | 2,030 |

*Source: IMF/IFS database*

**Price decomposition**

Price changes were decomposed based on a framework applied by Quiroz and Valdes (1993) that bases decompositions on real prices and exchange rate data. The technique works as follows:

Assume that the domestic price of a product for some period '0' is determined as in equation 1:

$$P^0_d = P^0_w * E^0 * t^0 * c^0 \quad (1)$$

Where $P_d$ is the domestic price (for example at the farm level), $P_w$ is the world price, E is the exchange rate, t (or (1+t), to be exact) represents ad

valorem tariff and c (or (1+c) to be exact) represents other (proportional) costs (such as transport and marketing costs).

A similar relationship is defined for some other period (period 1) in equation 2:

$$P^1_d = P^1_w * E^1 (1+t^1) * (1+c^1) \quad (2)$$

Taking logs (ln0 of both equations and subtracting (1) from (2), one obtains equation (3):

$$(\ln P^1_d - \ln P^0_d) = (\ln P^1_w - \ln P^0_w) + (\ln E^1 - \ln E^0) + (\ln t^1 - \ln t^0) + (\ln c^1 - \ln c^0) \quad (3)$$

Since the first-order difference of logs gives approximate percentage change (after multiplying by 100), the change in domestic price is decomposed in such a way that the contributions of the four factors sum up to the change in domestic prices. The sources of change in domestic prices of cereals (maize, wheat and rice) and exports (coffee and tea) were decomposed into changes in domestic marketing margins, world prices, exchange rates, tariffs and other sources of change (such as domestic marketing margins and transport). Tables 16 and 17 show the sources of change for domestic prices for the selected commodities.

**Table 16: Decomposition of the sources of change in domestic prices before liberalization (1990-1994)**

| Commodity | Change in domestic price | Change in world price | Exchange rate | Other factors |
|---|---|---|---|---|
| Maize | 13.5 | 1.6 | 23.5 | –11.6 |
| Wheat | 5.5 | 8.5 | 23.5 | –26.5 |
| Rice | –22.6 | 4.4 | 23.5 | –21.9 |
| Coffee | 4.5 | 37.9 | 23.5 | –25.9 |
| Tea | 3.1 | –0.1 | 23.5 | 4.8 |

*Source: Authors' compilation from Economic Survey (various)*

**Table 17: Decomposition of the sources of change in domestic prices after liberalization (1995-2000)**

| Commodity | Change in domestic price | Change in world price | Exchange rate | Other factors |
|---|---|---|---|---|
| Maize | -0.4 | -2.8 | 5.1 | –2.7 |
| Wheat | -2.1 | -6.6 | 5.1 | –0.5 |
| Rice | 8.3 | -9.5 | 5.1 | 12.7 |
| Coffee | -11.1 | -7.9 | 5.1 | –8.2 |
| Tea | 6.1 | 0.9 | 5.1 | -6.8 |

*Source: Authors' compilation from Economic Survey (various)*

The results indicate that the sources of price changes in cereals and export crops before the reforms were mainly exchange rate movements, except for coffee, for which the price changes resulted from changes in world market prices. After the reforms, changes in domestic prices of maize and wheat could be attributed to changes in the exchange rate and the world market price. However, prices for rice were affected more by other factors such as domestic marketing margins and government interventions. Changes in coffee prices after the reforms are explained more by change in world market prices, other factors and exchange rate movements in that order, while tea prices were influenced more by changes in domestic producer prices, other factors and exchange rate movement, in that order.

## 4.2 Domestic supply response

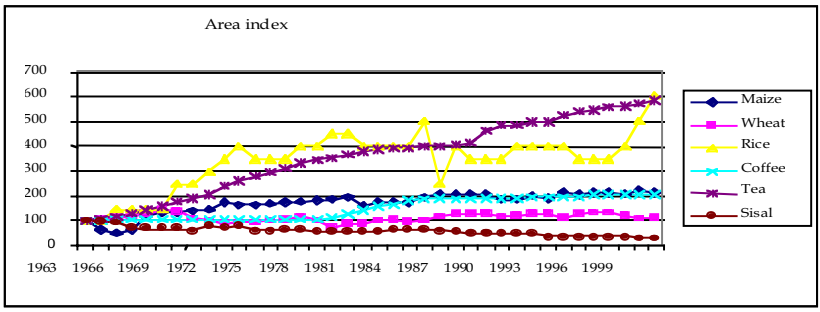
Agricultural production in Kenya has been on the decline, but the trends in growth have not been uniform among commodities. These trends are attributed to a number of factors, including area expansion or contraction, yield changes due to climate factors, technological changes and prices. While it is true that climate factors such as drought are important in explaining Kenya's agricultural performance, the main factors are policy related. Further, although some commodities like tea show a general increasing trend in production, this is attributed to

increase in crop area rather than in productivity. In all cases, productivity of all the commodities is low compared with research station results. This is an indication that Kenyan farmers may not be using new technologies or research recommendations.

### Area and yield performance

The growth in cropped area shows mixed trends (figure 4), generally increasing for food crops (maize and wheat) and cash crops (tea and coffee). However, the area under industrial crops, particularly sisal, generally decreased. Given these trends, the decline in production can only be attributed to decline in yields.

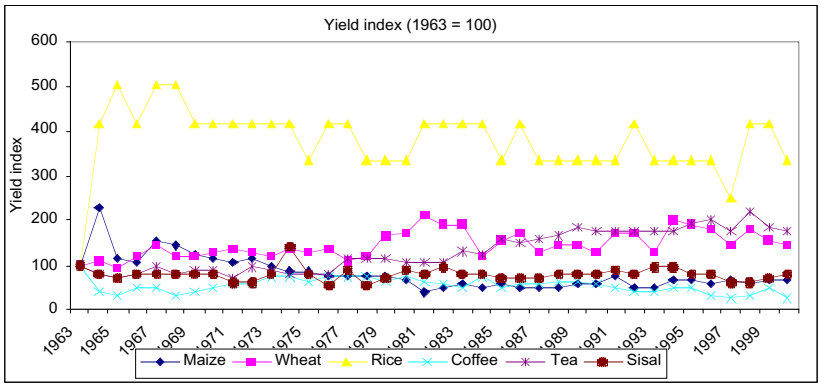
**Figure 4: Area index under major crops, 1963-2000, (1963 = 100)**




*Source: Economic Survey (various)*

The impact of technological factors is shown by change in yields. Yields of most crops have stagnated since 1980, although some increases have occurred for a few crops such as tea and wheat (figure 5). A common feature for all crops is periodical fluctuations in yields. Different levels of crop husbandry practices, fertilizer and chemical use, quality of seed, production techniques and climate conditions also explain the fluctuations in yields. Maize production has seen the worst declines in yield (compared with yields in the 1960s) owing to persistent droughts and poor adoption of recommended husbandry practices.

**Figure 5: Yields of major crops, 1963-2000**

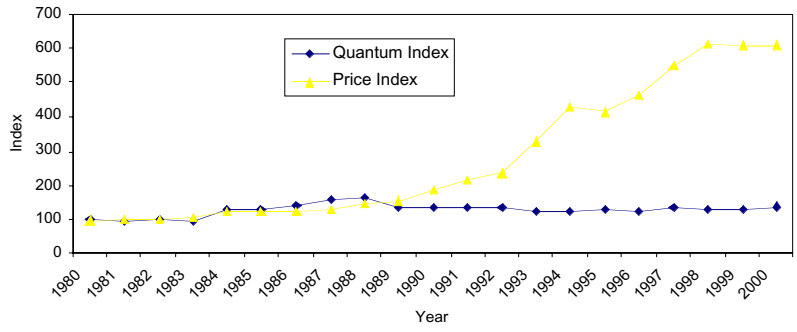



*Source: Economic Survey (various)*

**Inputs use and prices**

Input use among farmers, particularly smallholders, has been low. The quantum index for all non-factor inputs has been almost constant since 1986, while the price index has been increasing (figure 6). Input prices recorded a dramatic increase, reaching 427 (1982 = 100) in 1994, slightly declining in 1995, but rising again in 1996. The rapid price increase was attributed to inflationary conditions and weakening of the Kenya shilling.

**Figure 6: Agricultural input indices (1982 = 100)**




*Source: Economic Survey (various)*

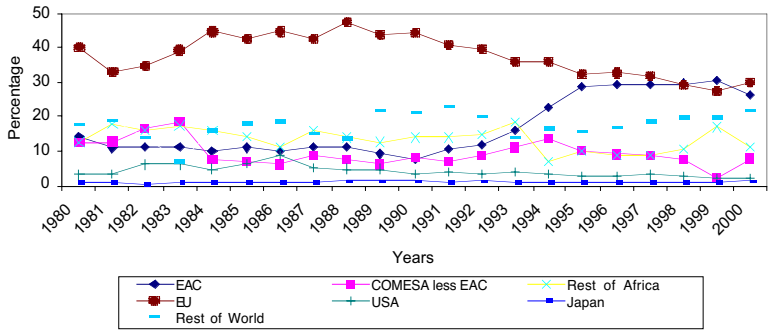
Input prices are also sensitive to exchange rate policies, since most inputs are imported or have large import components. Input use levels have remained more or less constant since the mid 1980s. This is attributed to the fact that only a few farmers, mainly in the large-scale and plantation sectors, use high levels of purchased inputs, since they can afford to do so and are less sensitive to price changes for as long as input use is profitable. However, input access has improved with the reforms, since more input dealers have been licensed and inputs are sold in smaller quantities. However, the level of input use, especially by small-scale farmers, is still low owing to increased prices and credit unavailability that accompanied the reforms.

**Trade response**

The mixed trends in agricultural exports may be attributed to market access limitations and supply constraints in the country. Market access is explained by trends in export flows to the major market destinations. The major destinations of Kenya's exports during 1980-2000 were the East African Community (EAC), the EU and COMESA (figure 7). The EU was the dominant market for the exports until 1997, when the EAC took over, and it continues to dominate. This may have resulted from the regional trade agreement formed by the three East African countries[1]. Kenya's trade with the COMESA region excluding EAC countries has been increasing in recent years. The data also show that Kenya's trade has increased for other countries in Africa, possibly as a consequence of regional integration efforts. However, increase in trade with the rest of the world other than the EU has been marginal. A significant decline of about 9% has occurred in trade with EU since 1990. This is an indication that market access for Kenyan products outside Africa has not been favourable in recent years.

[1] The three East African countries formed the East African Cooperation in 1996, which was transformed into the East African Community in 2001. The target is to establish an East African Customs Union.

**Figure 7: Destination of exports as a percentage of total exports**




*Source: Economic Survey (various)*

Liberalization has not greatly changed Kenya's trade pattern of exports. The main destinations of exports of agricultural commodities are EU countries for coffee, horticulture and tea; Asian countries for tea and coffee; and COMESA and EAC countries for tea and processed food products.

# 5. Impact of Policy Changes on Farm Household Incomes

This section analyses the effect of changes in the agricultural sector on household incomes and expenditures. It outlines the types of households considered, changes in incomes and expenditures and their relationship with agricultural sector changes.

## 5.1 Household types

The characteristics of households considered in this analysis represent the averages of sampled households in six provinces of Kenya: Central, Coast, Nyanza, Western, Rift Valley and Eastern. The sources of the data were the Rural Household Budget Survey of 1981, and the Welfare Monitoring Survey II of 1994 (GoK, 1994) and III of 1997. The main characteristics of the households are presented in table 18. The majority of rural households (60.9%) had farm sizes ranging from 0.01 ha to 1.99 ha in 1994; this declined to 33.2% by 1997. Seventy-four percent (74%) of households had farm sizes that were less than 4 ha in 1997. The majority of households with farms smaller than 2 ha are in Central, Nyanza, Western and Eastern provinces. This is an indication of the scarcity of land in these regions. However, it should be noted that the proportion of the landless has declined from the 1994 level, probably as a result of resettlement of people between 1994 and 1997.

The average size of rural households has declined from 5.6 persons in 1994 to 4.9 persons in 1997 following declines in population growth rates. This trend is common in all regions except for Coast Province where household size has remained at 5.3 persons.

**Table 18: Average land and household size**

| Region | Average farm holding (% of population) | | | | | | | | Average household size (No.) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1994 | | | | 1997 | | | | | |
| | Landless | 0.01-1.99 ha | 2-3.99 ha | 4.0+ ha | Landless | 0.01-1.99 ha | 2-3.99 ha | 4+ ha | 1994 | 1997 |
| Central | 27.4 | 65.3 | 5.6 | 1.7 | 15.8 | 49.7 | 24.7 | 9.8 | 5.1 | 4.3 |
| Coast | 49.4 | 32.4 | 10.5 | 7.7 | 13.3 | 19.3 | 33.2 | 34.2 | 5.3 | 5.3 |
| Eastern | 11.5 | 55.6 | 17.4 | 15.5 | 11.4 | 26.3 | 28.5 | 33.8 | 5.8 | 5.5 |
| Nyanza | 10.6 | 64.0 | 15.9 | 9.5 | 9.9 | 32.4 | 35.9 | 21.8 | 5.0 | 4.8 |
| Rift Valley | 26.8 | 46.5 | 14.0 | 12.7 | 14.3 | 28.2 | 26.3 | 31.2 | 5.3 | 4.9 |
| Western | 7.5 | 69.1 | 16.1 | 7.3 | 6.0 | 45.2 | 26.2 | 22.6 | 5.8 | 5.0 |
| Rural | 13.6 | 60.9 | 14.8 | 10.7 | 11.5 | 33.2 | 29.4 | 25.9 | 5.6 | 4.9 |

*Source: Government of Kenya, 1994, 1996 and 2000*

The relationship of household size to incomes is indeterminate. On the one hand it can mean that household incomes increase with household size because more labour is available for farm or off-farm activities. On the other hand, the relationships may not be clear if no opportunities exist for households to increase incomes from their labour. Household landholding and household size affect household incomes. Households with larger farms, particularly in high potential areas, can be expected to have higher incomes.

## 5.2 Farming activities

The dominant farming activities vary from province to province, and are determined mostly by agroclimatic conditions (table 19). Rift Valley Province dominates in food crop production, and accounted for about 33% of the total national production in 1997, followed by Central Province with about 24% of the total production. Coast Province had the lowest production of food crops, estimated at about 3%. Central Province dominates in cash crop production, accounting for about 82% of the national production in 1997. It was followed at a distance by Nyanza Province, with about 8%.

**Table 19: Contribution of regions (%) in agricultural production and major farming activities in Kenya in 1997**

| Region | Central | Coast | Nyanza | Western | Rift Valley | Eastern | Total ('000 t) |
|---|---|---|---|---|---|---|---|
| Food crops | 24.3 | 2.9 | 16.7 | 12.0 | 32.9 | 11.3 | 2,624.9 |
| Maize | 18.5 | 3.3 | 10.8 | 14.6 | 43.9 | 8.7 | 1,559.1 |
| Wheat | 3.5 | – | 0.4 | – | 86.7 | 9.4 | 45.1 |
| Potatoes | 65.9 | 0.1 | 3.4 | 7.0 | 15.4 | 8.2 | 429.1 |
| Millets | 0.1 | 0.1 | 72.3 | 6.8 | 7.7 | 13.0 | 260.7 |
| Other | 19.2 | 7.3 | 20.1 | 11.4 | 15.8 | 26.2 | 331.1 |
| Cash crops | 81.5 | 0.7 | 8.4 | 2.1 | 4.3 | 3.0 | 313.2 |
| Tea | 87.3 | – | 6.5 | – | 2.2 | 4.0 | 203.6 |
| Coffee | 98.2 | – | 1.1 | – | 0.3 | 0.4 | 78.2 |
| Sugar | – | – | 53.3 | 34.5 | 11.0 | 1.1 | 3.8 |
| Cotton | – | 46.9 | 8.9 | 32.1 | – | 12.1 | 1.5 |
| Others | 1.9 | 5.6 | 39.3 | 18.3 | 32.6 | 2.4 | 25.9 |
| Horticulture | 70.2 | 1.9 | 4.4 | 3.0 | 16.3 | 4.2 | 411.7 |
| Vegetables | 70.5 | 1.9 | 4.2 | 3.0 | 16.2 | 4.1 | 409.8 |
| Fruits | 1.0 | 5.4 | 49.1 | 0.6 | 35.4 | 8.5 | 1.7 |
| Herbs & spices | 30.2 | 9.9 | 9.5 | 11.2 | 19.0 | 20.2 | 0.2 |
| Livestock | | | | | | | Total numbers |
| Livestock | 20.3 | 3.7 | 20.5 | 12.6 | 22.9 | 19.9 | 6,340,090 |
| Cattle | 23.8 | 1.7 | 17.9 | 12.4 | 25.7 | 18.5 | 2,269,463 |
| Poultry | 18.6 | 4.9 | 23.1 | 16.6 | 18.8 | 17.9 | 2,277,246 |
| Others | 18.0 | 4.8 | 20.4 | 8.0 | 24.7 | 24.2 | 1,793,381 |

*Source: Government of Kenya, 1997 and 2002*

Coast, Western and Nyanza provinces produce the less lucrative cash crops (sugar, cotton and others), while Central Province dominantly produces the more lucrative cash crops (tea and coffee). Nyanza, Rift Valley and Eastern provinces produce small proportions of almost all cash crops. Central Province also dominates in horticulture production, and accounted for about 70% of the total national production, followed by Rift Valley Province with about 16%. The other regions accounted for only about 14% of the total production.

National livestock numbers are fairly evenly distributed across three provinces: Rift Valley (23%), Central (20%) and Nyanza (21%). Coast Province has the least numbers, accounting for about 4% of the national herd. Cattle and poultry rearing are the main livestock activities, accounting for about two-thirds of the total livestock numbers.

The land most suitable for farming activities, particularly crop and intensive livestock production, is the high potential area. Central Province has about 14% of Kenya's high potential area, which makes up about 70% of the province's total area.

Considering Central Province's contribution to the national production of crops and livestock, it is apparent that land in this province is intensively used. Although Rift Valley and Nyanza provinces have about two-thirds of the high potential land out of the total, the combined contribution of the two provinces to agricultural production particularly for cash crops and horticulture is lower than that of Central Province. This indicates that land use in Nyanza and Rift Valley provinces is not as intense as in Central Province. Coast Province has only 1% of Kenya's high potential land, the reason for its low contribution to agricultural production.

It can be inferred from these data that the more scarce the high potential land is, the more intensively it is used, and vice versa. The low potential areas in general contribute less to total national agricultural production.

This is explained by the poor agro-climatic conditions and the remoteness of the regions from the markets owing to poor infrastructure. Opportunities for increasing agricultural production lie in intensifying production in the high potential areas, which is constrained by lack of improved technologies and limited use of productivity-enhancing inputs. Similarly, improved technologies such as drought-tolerant crop varieties and infrastructure development to improve market access for livestock and livestock products would enhance exploitation of low potential areas.

## 5.3 Household incomes

The focus of the household analysis in this section is rural agricultural households. The changes in household incomes and expenditures are shown in tables 20 and 21.

### Sources of income

The sources and levels of household income for the six provinces are shown in table 20. They include farm income derived from agricultural activities (crop and livestock sale and home consumption), on-farm income (appendix table 1), off-farm income from non-agricultural activities and employment, and remittances, i.e. incomes from family members living outside the farm (appendix table 2). Incomes are highest in Rift Valley Province, estimated at Ksh 15,031in 1982, Ksh, 31,727 in 1994 and Ksh 17,791 in 1997, using 1986 real prices. The lowest incomes are in Eastern Province, estimated at Ksh 115,564 in 1982, Ksh 17,033 in 1994 and Ksh 6,078 in 1997. The incomes vary from region to region depending on their sources.

**Table 20: Sources of income for rural households by region (Ksh per annum) (1986 = 100)**

| Province | 1982 | | | | 1994 | | | | 1997 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Farm | Off-farm | Remittances | Total | Farm | Off-farm | Remittances | Total | Farm | Off-farm | Remittances | Total |
| Central | 6,410(38.5) | 7,088(42.5) | 3,161 (19) | 16,659 | 8,310(34.6) | 15,070(62.7) | 637(2.7) | 24,017 | 2,394(38.7) | 3,366(54.4) | 425(6.9) | 6,185 |
| Coast | 4,876(37.4) | 6,691(51.3) | 1,479(11.3) | 13,046 | 5,790(22.6) | 18,517(72.2) | 1,333(5.2) | 25,640 | 1,801(24.9) | 4,784(66) | 662(9.1) | 7,246 |
| Nyanza | 4,142(35) | 5,523(46.7) | 2,162(18.3) | 11,827 | 6,149(35.2) | 10,088(57.7) | 1,257(7.2) | 17,493 | 1,266(21.9) | 3,875(67) | 644(11.1) | 5,785 |
| Western | 4,578(41.7) | 4,473(40.7) | 1,940(17.6) | 10,991 | 7,514(37.9) | 10,896(54.9) | 1,441(7.3) | 19,851 | 1,665(35.7) | 2,011(43.2) | 984(21.1) | 4,661 |
| Rift Valley | 10,112(67.3) | 4,158(27.7) | 761(5.1) | 15,031 | 15,853(50) | 14,582(46) | 1,292(4) | 31,727 | 12,727(71.5) | 4,734(26.6) | 329(1.9) | 17,791 |
| Eastern | 7,783(50) | 5,739(36.9) | 2,043(13.1) | 15,564 | 6,190(36.3) | 10,077(59.2) | 765(4.5) | 17,033 | 1,324(21.8) | 4,045(66.6) | 709(11.7) | 6,078 |
| Total rural | 6,744(48) | 5,358(38.2) | 1,927(13.7) | 14,028 | 10,241(46.4) | 10,653(48.3) | 1,157(5.2) | 22,051 | 4,312(49.7)) | 3,784(43.6) | 583(6.7) | 8,679 |

Note: Figures in parentheses are the proportion of income category as a percentage. The data was collected from same households over the period under consideration based on a sampling frame developed by the Central Bureau of Statistics, Ministry of Planning and National Development.

*Source: Government of Kenya 1982, 1988, 1994 and 1997*

Farm incomes from sale of crops and other produce, livestock and land (appendix table 1) dominated in five regions in 1982, averaging about 75% of total household income for Rift Valley, 62% for Eastern, 55% for Western, 53% for Nyanza and 47% for Coast. The contribution of farm income to household income declined in 1994 and 1997 for all regions except Rift Valley Province, where it was 72% in 1997. For the other regions, farm incomes contributed less than 50% of household income in 1994 and 1997. This indicates that the role of farm income in household income is diminishing over time in most of Kenya except for the Rift Valley Province.

Off-farm incomes, comprising wages and profits from off-farm and informal enterprises (appendix table 2), are an important component of household incomes and contributed over 50% of total household income for four regions in 1994 and 1997, estimated at 62.7% and 54.4%, respectively, for Central; 72.2% and 66%, respectively, for Coast; 57.7% and 67%, respectively, for Nyanza; and 59.2% and 66.6%, respectively, for Eastern. The contribution of off-farm income is lowest in Rift Valley Province, where it was estimated at 46% and 26.6% for 1994 and 1997, respectively.

Remittances are gaining prominence as a source of household income, increasing from less than 10% of the total household incomes for all regions to become a major component by 1997, and going as high as 21.1% in Western Province.

Male-headed households had higher incomes than female-headed households in all regions in 1997 (table 21). For both groups, off-farm income was the main source of income in all regions except in Rift Valley Province, where farm incomes are the most important for both males and females.

**Table 21: Sources of income according to head of household, 1997 (1986 = 100)**

| | Farm | Off-farm and remittances |
|---|---|---|
| Central | | |
| Male | 2,560 (39.4%) | 3,936 (60.6%) |
| Female | 1,816 (33.1%) | 3,676 (66.9%) |
| Coast | | |
| Male | 1,860 (23.7%) | 5,980 (76.3%) |
| Female | 1,316 (14.5%) | 7,783 (85.5%) |
| Nyanza | | |
| Male | 1,781 (24.4%) | 5,530 (75.6%) |
| Female | 646 (19.4%) | 2,680 (80.6%) |
| Western | | |
| Male | 1,738 (29.5%) | 4,159 (70.5%) |
| Female | 1,552 (36.5%) | 2,701 (63.5%) |
| Rift valley | | |
| Male | 14,946 (67.0%) | 7,351 (33.0%) |
| Female | 8,106 (62.4%) | 4,884 (37.6%) |
| Eastern | | |
| Male | 1,225 (18.3%) | 5,474 (81.7%) |
| Female | 714 (19.6%) | 2,932 (80.4%) |

*Source: Government of Kenya, 1997*

**Changes in incomes**

Average household incomes increased for all regions between 1982 and 1994 but declined between 1994 and 1997. There was a 133% increase in incomes in Rift Valley between 1982 and 1994 and a decline of about 40% between 1994 and 1997. Similarly, in Eastern Province, where household incomes were lowest, there was a 36% increase in incomes between 1992 and 1994 and a decline of 64% between 1994 and 1997. The general trend in income changes applies to all the regions. The decline in incomes between 1994 and 1997 affected all sources of household incomes. The gap between the highest (Rift Valley) and the lowest (Eastern) household income widened from Ksh 1,051 in 1982 to Ksh 14,695 in 1994, and Ksh 11,702 in 1997. These data show that rural

households have become worse off since 1994 (with the reforms). The contribution of farm incomes from various sources such as crops, livestock and other sources (land sales and agro-processed products) to total household income has significantly changed over time.

There has been a general increase in the share of income from livestock enterprises over time. In 1994, incomes from livestock and livestock products dominated in all regions except Coast and Central provinces, where crop incomes accounted for 54% and 50%, respectively, compared with 69% and 68%, respectively, in 1997. The levels for the other regions in 1994 and 1997 were 28%[2] and 54% for Nyanza, 28% and 60% for Western, 24% and 96% for Rift Valley and 34% and 68% for Eastern. Therefore, there has been a shift away from dominance of income from crops to livestock and livestock products, which may be a response to the low prices for crops or a reduction in crop production in comparison with livestock and livestock products.

Off-farm activities were an important source of household incomes in 1994 and remained important in all regions in 1997 except Rift Valley and Western provinces. Their contribution, however, declined in 1997 except for Nyanza and Eastern regions. The role of wages as the main source of farm income diminished between 1994 and 1997 to be overtaken by informal business (appendix table 2). Wages were the biggest contributor to off-farm income in 1994 for Central (76%), Coast (78%), Western (57%) and Rift Valley (59%) but was lower in Nyanza (49%) and Eastern (40%). However, for all regions, wages had been overtaken by informal business as the main source of off-farm income by 1997, contributing 67% of the household income in Western, 65% in Central, 64% in Rift Valley and 63% in Coast, Eastern and Nyanza.

[2] The percentage for 1994 is lower in all cases because the data recorded own consumption comprising of crops and livestock income separately while 1997 data recorded livestock and crop incomes separately without indicating own consumption separately.

The data on changes in income (appendix table 2) show a shift from dominance of farm income in household income in 1982 to prominence of off-farm incomes for most regions in Kenya. The contribution of off-farm income was highest in 1994 but declined for four of the regions in 1997. This is an indication that the role of farming activities in household incomes is diminishing. There was a shift from dominance of wages in 1994 to dominance of informal business in 1997. This might be a reflection of the diminishing role of agriculture as a main source of employment in rural areas. The trend has favoured the services sector, represented by informal business.

## 5.4 Household expenditures

The profile of household expenditures (excluding farm production) is presented in table 22. The expenditures are categorized into food items comprising starches (cereals and root crops), proteins (milk and meats), fats and oils and vegetables (fruits, beans and sugar) and non-food items comprising medical and education, household goods and other household expenses, but excluding farm expenses. The mean food expenditure per household ranged from Ksh 4,677 in Coast Province to Ksh 7,806 in Central Province in 1982; from Ksh 9,807 in Eastern Province to Ksh 12,248 in Central Province in 1994, and from Ksh 5,808 in Eastern Province to Ksh 6,871 in Coast province for 1997[3].

[3] Data for 1997 are separated for poor and non-poor households; the figure used here is for the poor.

**Table 22: Household expenditure per annum (Ksh) (1986 =1 00)**

| Region | 1982 | | | 1994 | | | 1997 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Poor | | | Non-poor | | |
| | Food | Non-food | Total | Food | Non-food | Total | Food | Non-food | Total | Food | Non-food | Total |
| Central | 7,806(70.3) | 3,298(29.7) | 11,104 | 12,248(71.5) | 4,882(28.5) | 17,130 | 6,631(81.7) | 1,481(18.3) | 5,927 | 13,033(65.3) | 6,913(34.7) | 13,467 |
| Coast | 4,677(68.5) | 2,151(31.5) | 6,828 | 13,947(73.4) | 5,048(26.6) | 18,995 | 6,871(83.1) | 1,398(16.9) | 7,344 | 11,903(68.8) | 5,406(31.2) | 14,719 |
| Nyanza | 4,782(65.5) | 2,519(34.5) | 7,301 | 11,425(72.8) | 4,277(27.2) | 15,705 | 5,874(83.5) | 1,157(16.5) | 5,669 | 10,992(73.7) | 3,926(26.3) | 12,376 |
| Western | 5,442(68.8) | 2,468(31.2) | 7,910 | 11,106(74.7) | 3,761(25.3) | 14,867 | 5,808(82.4) | 1,242(17.6) | 5,576 | 11,377(72.6) | 4,289(27.4) | 13,767 |
| Rift Valley | 5,686(69.8) | 2,460(30.2) | 8,146 | 14,193(72.2) | 5,467(27.8) | 19,660 | 6,151(81.9) | 1,361(18.1) | 6,057 | 12,568(69.9) | 5,424(30.1) | 13,375 |
| Eastern | 6,724(71.3) | 2,707(28.7) | 9,431 | 9,807(69.3) | 4,345(30.7) | 14,152 | 6,521(83.5) | 1,291(16.5) | 5,632 | 13,874(73.3) | 5,048(26.7) | 13.240 |
| Total rural | 5,679(64) | 3,211(36) | 8,890 | 12,297(75) | 4,200(25) | 16,497 | 6,199(83) | 1,295(17) | 7,494 | 12,444(70) | 5,386(30) | 17,829 |

Note

Percentage share of each expenditure category is provided in the brackets.

*Source: Government of Kenya, 1994 and 1997*

Expenditure on food items accounts for more than 50% of household expenses for all regions and all periods Therefore, most of the households spend most of their income on food items, with amounts going as high as 83% of the total household expenditure. The variation in household expenditures corresponds to changes in incomes. Also, there has been a decrease in household expenditure in real terms during the reform period.

A comparison of food access among regions shows that purchases are dominant as opposed to subsistence food production (table 23). On average 70% of food in the rural areas is purchased, and approximately 30% is produced by the households. Therefore, both farm and off-farm household incomes are vital determinants of food access. It is evident that both the poor and the non-poor purchase much of their food requirements, and in all regions. However, in Rift Valley the poor purchase a larger part of their food than do the non-poor. This implies that in the post-reforms era the poor face the same food prices as the non-poor. This has deepened poverty.

Food production varies among regions according to availability of high potential land. Most of food production is concentrated in Rift Valley, Central, Western and Nyanza provinces, which have large tracts of high potential land.

**Table 23: Share of own produced and purchased food for rural households (1997)**

| Province | Non-poor | | Poor | |
|---|---|---|---|---|
| | Share of food produced on the farm (%) | Share of purchased food (%) | Share of food produced on the farm (%) | Share of purchased food (%) |
| Central | 26.1 | 73.9 | 21.7 | 78.3 |
| Coast | 17.2 | 82.8 | 12.6 | 87.4 |
| Eastern | 34.0 | 66.0 | 28.5 | 71.5 |
| Nyanza | 37.7 | 62.3 | 38.5 | 61.5 |
| Rift Valley | 38.0 | 62.0 | 39.0 | 61.0 |
| Western | 36.3 | 63.7 | 30.1 | 69.9 |
| Average rural | 32.8 | 67.2 | 31.6 | 68.4 |
| Average urban | 2.0 | 98.0 | 2.5 | 97.5 |

*Source: Government of Kenya, 2000*

## 5.5 Agricultural sector and changes in incomes and expenditures

The performance of the agricultural sector during the reforms period (after 1994) was poor. There was a general decline in agricultural production, which is reflected in the household incomes and expenditure for all regions. The decline in household incomes between 1994 and 1997 may be attributed to the general decline in performance of the agricultural sector. This also affected household expenditure on food items, which declined.

The poor performance of the agricultural sector may explain household dependence on off-farm incomes that dominated in the 1997 for all regions except for Rift Valley Province. However, income from off-farm sources did not adequately provide for household expenditure needs, since the data show a decline in household expenditure between 1994

and 1997. Furthermore, the decline in wages during that period indicates that the poor performance of the agricultural sector may also have affected off-farm job opportunities. This is because rural off-farm job opportunities in such services as agro-processing, manufacturing of farm inputs and marketing of farm inputs are closely linked to the performance of the agricultural sector.

# 6. Implications of the Policy Reforms on Food Security

This section presents the analysis of the implications of policy reforms on food security, focusing on national and household supply factors.

## 6.1 Nation-level food production

Domestic food supply is analysed using the food production index (FPI) (1989 = 100), the cereal self-provision ratio (CSPR) and the cereal import dependency ratio (CIDR) (table 24). The FPI is defined as the quantity of food produced in a given year divided by the total food production in the base year (1989). The CSPR is defined as the total amount of cereals available from domestic production to cover consumption requirements in a month. A ratio of 100% means that domestic production covers consumption requirements that month. The number of months in which a 100% ratio is achieved is used to indicate the capacity of a country to meet its food needs from domestic supplies. The CIDR is defined as the ratio of cereal imports to total domestic production of cereals in a year.

Before 1989 the FPI was below the baseline, but it slowly increased to 103.6 in 1994, and later increased slowly after the reforms to a 7% mark above the base in 2000. The low level of increase is an indication that overall agricultural supply response is limited. This may be attributed

**Table 24: Food production index, cereal import dependency ratio and cereal self-provision ratio, 1982-2000**

| Years | FPI (1989=100) | CIDR | CSPR |
|---|---|---|---|
| 1982 | 76.0 | 0.11 | 12 |
| 1985 | 80.4 | 0.10 | 12 |
| 1988 | 98.4 | 0.04 | 12 |
| 1991 | 99.4 | 0.13 | 10 |
| 1994 | 103.6 | 0.36 | 10 |
| 1997 | 106.1 | 0.48 | 10 |
| 2000 | 107.7 | 0.50 | 9 |

*Source: World Bank, 2002*

to structural factors, including poor infrastructure and limited use of purchased inputs, rather than policy reforms per se.

The CSPR indicates a country's capability to supply food all the year round. This indicator shows that Kenya's capacity to supply cereals is declining. Kenya attained cereal self-provision capacity of 100% in 1982, 1985 and 1988. Although there were droughts in the mid 1980s some regions produced enough to ensure a national CSPR of 100%. There were problems, though, emanating from restrictions on regional movements of food products. For 1991, 1994 and 1999, the cereal provision capacity covered only 10 months. By the year 2000 only nine months were covered owing to the droughts that year. The CIDR, on the other hand, increased during the reform period, rising to a level of 0.5 in 2000. This shows that cereal imports also increased over the period.

The supply capacity of food was analysed using animal protein, fat and cereal supply per diet (table 25). The rate of change for animal protein supply per person increased until 1988, then decreased during 1988-1991. This can be explained by the increased milk supply attributed to the free primary school milk programme of the early 1980s that may have created incentives for increasing milk production in the country. This programme was discontinued in 1990 due to its high cost to the government in the face of fiscal policies to tighten government expenditure. The decrease in animal protein supply per capita is attributed to the drought the country suffered during the period, which reduced the availability of livestock products. Since the reforms, animal protein supply has continued to decrease, partly because of the declining production of these products.

**Table 25: Protein, dietary fat and cereal supply per person (equivalent of an adult male aged 30-60 years and weighing 60 kg), 1982-2000 (gm/day)**

| Year | Protein supply | %Δ in proteins | Fat supply | %Δ fats | Cereal supply | %Δ in cereals |
|---|---|---|---|---|---|---|
| 1982 | 15.0 | - | 41.9 | - | 140.1 | - |
| 1985 | 15.7 | 0.05 | 40.9 | -0.02 | 140.4 | 0.002 |
| 1988 | 18.4 | 0.17 | 42.1 | 0.03 | 117.9 | -0.16 |
| 1991 | 17.7 | -0.04 | 46.4 | 0.10 | 106.2 | -0.10 |
| 1994 | 15.9 | -0.10 | 45.2 | -0.18 | 120.6 | 0.14 |
| 1997 | 15.6 | -0.02 | 46.4 | 0.03 | 119.1 | -0.01 |
| 2000 | 15.2 | -0.03 | 46.9 | 0.01 | 115.6 | -0.03 |

*Source: World Bank, 2002*

The dietary fat supply per person (gm/day) increased at a slow rate both before and after the reforms (table 25). This increase mainly occurred in urban centres. The country embarked on large importations to meet this demand. In a basic subsistence food basket for the urban poor, the total expenditure on oils and fats is 6.7%; the non-poor spend 6.3% on these items. This indicates that fats and oils are not a major item in the basic subsistence diet of rural households.

Per capita cereal supply decreased in both the pre- and post-reforms periods. This decline is attributed to the decline in maize, wheat and rice production, although availability of other cereals (millets and sorghums), commonly referred to as traditional crops, could be responsible for the decline.

Production of maize, wheat and rice has declined from the high levels of 1987, showing mixed trends in growth. Policy shifts, particularly liberalization of markets and prices which affected producer incentives, are partly responsible for the changes in the supply of maize, wheat and rice. However, traditional cereals were not part of the commodities that the government controlled and set prices for before the reforms. The price incentives to produce traditional crops were based on 'policy spill over effects' from schedule crops. If producer prices for maize in particular were high, most farmers switched to growing maize at the

expense of traditional crops, and vice versa. This reduced per capita supply of the traditional cereals when producer prices for schedule crops (maize, wheat and rice) were more favourable. But even when producer prices for maize were low, production of traditional crops has been low due to factors such as poor consumer preference, which limits their market, therefore generating a dampening effect on their production.

## 6.2 Food import capacity

Kenya depends on imports, especially for commodities such as maize, wheat, rice and sugar. Imports significantly increased during the reform period (table 26). However, the capacity to import has declined because of the poor performance of exports (table 11). Furthermore, the ratio of the value of imports to the value of total exports and agricultural exports after the reform period saw a general increase, indicating that the country is spending a large proportion of its export earnings on food imports and incurring a high import bill, which affects the government's ability to finance other socioeconomic development activities such as health and education, which are also important in poverty reduction.

**Table 26: Imports of foodstuffs, animal and vegetable oils and fats (t)**

| Year | Foodstuffs | Animal and vegetable oils and fats | Total |
|---|---|---|---|
| 1987 | 324.9 | 135.7 | 460.6 |
| 1988 | 110.8 | 135.2 | 246.0 |
| 1989 | 208.7 | 151.1 | 359.8 |
| 1991 | 305.9 | 178.8 | 484.7 |
| 1992 | 578.9 | 197.9 | 776.8 |

*Source: FAOSTAT*

## 6.3 Incidence of malnutrition

Child malnutrition is measured as the percentage of stunted and wasted children in the population. Stunting refers to the failure to grow adequately in height in relation to age and reflects past or chronic under-nutrition resulting from inadequate food intake over a long period and/ or repeated episodes of illness. Wasting is the failure to adequately gain weight in relation to height and reflects recent inadequacy of nutrition or current acute illness.

The level of malnutrition decreased between 1982 and 1987 in all regions except Coast Province. The general trend in levels of stunted children shows a decrease between 1982 and 1987 and an increase between 1987 and 1997 for all provinces. Given the time lag associated with stunting and the trends shown for household incomes, the stunting trends and therefore malnutrition are closely related to changes in household incomes and food production in the country. The period 1982 to 1987 showed increased incomes and agricultural growth, while major declines occurred in 1994 to 1997. Malnutrition trends reflect trends in income and agriculture, but are not attributable to policy reforms because they were the same for both pre- and post-reforms periods.

The percentage of wasted children shows mixed trends: increasing between 1982 and 1987 for all provinces except Central and Rift Valley provinces and increasing between 1987 and 1994 except for Nyanza Province. Improvements are shown for Eastern, Rift Valley and Western provinces in 1997. As a measure of recent impacts of nutrition, wasting does not accurately capture the long-term effects of changes in household income. However, the deterioration during 1987-1994 corresponds to the decline for all regions in household incomes (table 20) and agricultural production (figures 1 and 2).

**Table 27: Incidence of malnutrition by region for children aged 6–60 months, in 1982, 1987, 1994 and 1997**

| Province | % stunted (below 2SD) | | | | % wasted (below 2SD) | | | |
|---|---|---|---|---|---|---|---|---|
| | 1982 | 1987 | 1994 | 1997 | 1982 | 1987 | 1994 | 1997 |
| Central | 33.6 | 25.0 | 28.7 | 37.0 | 4.0 | 2.5 | 4.9 | 5.7 |
| Coast | 48.6 | 49.1 | 38.3 | 41.9 | 3.5 | 3.7 | 7.8 | 7.9 |
| Eastern | 39.0 | 38.5 | 38.5 | 40.7 | 3.5 | 3.7 | 7.8 | 6.2 |
| Nyanza | 43.1 | 41.3 | 36.4 | 38.1 | 5.5 | 6.2 | 5.5 | 9.7 |
| Rift Valley | 31.4 | 26.9 | 32.2 | 35.1 | 5.4 | 4.6 | 8.2 | 6.4 |
| Western | 40.5 | 22.4 | 37.0 | 40.6 | 3.0 | 3.5 | 8.0 | 4.6 |

*Source: Government of Kenya, 1994, 1997 and Economic Survey (various)*

## 6.4 Implication of policy reforms on household food security strategies

This section analyses the implication of policy reforms on household food security strategies using alternative livelihood strategies, household budgets and consumption behaviour, food prices and consumer purchasing power.

**Alternative livelihood strategies**

Rural households in Kenya depend on subsistence food production and food purchases. On average 70% of the food is purchased, and only 30% is produced on the farm. This means that most rural households are net food purchasers. On average, Kenyan households spend about 54% (56% in the rural and 41% in the urban areas) of their income on food (GoK, 1994). The fact that rural households spend more of their incomes on food is a reflection of their low income levels, following Engel's law. It is also evident that rural households do not produce enough food for their domestic requirements. Their dependence on agriculture for household incomes exposes them more to risk in so far as food security is concerned. There has also been a shift to dependence on off-farm activities and remittances as the main sources of household

income. This is a reflection of the diminishing role of farm incomes as sources of food security for rural households. The general decline in rural household incomes, which moves in the same direction as the decline in farm incomes, shows that rural households become more food insecure as performance of the agricultural sector declines.

## 6.5 Food consumption patterns

Maize, vegetables, beans, milk, meat, sugar, cereals and roots comprise about 82% of the food items for rural households (table 28). However, the actual composition of the food basket and proportions of each food item consumed vary from region to region.

**Table 28: Expenditure of rural poor on food items (% of total expenditure on food)**

| Region | Cereals | Maize | Meat | Milk | Vegetables | Beans | Sugar | Roots | Others |
|---|---|---|---|---|---|---|---|---|---|
| Central | 5.4 | 26.6 | 5.7 | 9.4 | 13.4 | 9.7 | 7.0 | 5.1 | 17.7 |
| Coast | 2.9 | 45.4 | 6.1 | 2.7 | 7.9 | 5.7 | 6.8 | 2.1 | 20.4 |
| Eastern | 4.6 | 33.6 | 4.7 | 6.1 | 10.6 | 16.9 | 5.0 | 4.2 | 14.3 |
| Nyanza | 10.0 | 18.8 | 10.2 | 6.2 | 16.1 | 5.3 | 6.4 | 6.1 | 20.9 |
| Rift Valley | 4.5 | 26.2 | 8.1 | 13.6 | 11.4 | 8.3 | 7.8 | 3.0 | 17.1 |
| Western | 3.6 | 21.8 | 9.5 | 7.0 | 17.6 | 4.6 | 8.2 | 9.2 | 18.5 |
| Total rural | 5.7 | 26.8 | 7.7 | 8.1 | 13.2 | 8.7 | 6.8 | 5.0 | 18.0 |

*Source: Government of Kenya, 2000*

During income stress periods, the food-poor cope by borrowing and begging food and relying on relief food, especially in the drought-prone areas. Redistribution of income or food through remittances has been shown to play a key role in 'buffering´ household food consumption during times of food stress. The uncertainty and budgetary implications of redistribution of food through remittances and famine relief programmes make these households insecure owing to their vulnerability to drought and low incomes.

In rural Kenya, the food insecure people are concentrated among poor pastoralists; those inhabiting drought-prone or marginal areas (this group is extremely vulnerable as they are affected by fluctuations in climate; and households that are resource poor but live in the high potential agricultural areas. The rising population has led to reduced land sizes in highly productive agricultural areas (Vihiga and Kisii) and pushed off livestock (e.g. in Samburu District in the Rift Valley) and wildlife (e.g. in Taita–Taveta in Coast Province) to more marginal and drought-prone areas.

## 6.6 Consumer purchasing power and food prices

Change in consumption patterns over time and variations in food demand for different commodity groups (staple grains, edible oil, meat, fruit and vegetables, etc.) are determined by household production and purchases. Because most poor households buy food to meet their needs, purchasing power and food prices have a major impact on food security. A household's purchasing power is measured using the cereals output price index (COPI) and the wages price index (WPI). Consumer price changes are measured using the consumer price index (CPI). These prices are determined by macroeconomic factors such as economic growth, trade balance and inflation. The analysis of macroeconomic factors shows that the Kenyan economy performed poorly in the 1990s. The agricultural sector growth rate and trade balance in particular showed a significant drop from 1997 onwards after a moderate performance in 1995 and 1996.

The inflation rate declined significantly in 1995 to reach 1.6% from a high of 46% in 1993, but was on the rise soon after. Macroeconomic factors affect food security output and consumer prices of agricultural commodities. The changes in the price variables are shown in table 29.

**Table 29: Consumer price[a], cereals output price[b] and wages indices[c]**

| Year | CPI (1986 = 100) | COPI (1986 = 100) | Wage index (1986 = 100) |
|---|---|---|---|
| 1982 | 71 | 58 | 73 |
| 1983 | 79 | 76 | 77 |
| 1985 | 96 | 94 | 91 |
| 1987 | 109 | 105 | 104 |
| 1989 | 137 | 116 | 128 |
| 1991 | 190 | 148 | 151 |
| 1993 | 359 | 343 | 186 |
| 1995 | 467 | 447 | 271 |
| 1997 | 569 | 673 | 398 |
| 1999 | 618 | 677 | 586 |
| 2001 | 653 | 680 | 771 |

Notes:

[a]Based on Nairobi lower income group
[b]Based on selling price to marketing boards
[c]Based on public sector wages
*Source: Economic Survey (various years)*

The COPI has an increasing trend, but there was a dramatic increase in 1993 of about 250% from the 1991 levels. There has been a general increase in prices, but this has been much lower since 1997, averaging about 3% per annum. There is a significant difference between farm-gate and market food prices, and this has implications on household food accessibility. In regions with a high proportion of food-poor households, where subsistence farming is the primary source of livelihood, selling of produce immediately after harvest when prices are low is common. The low price is a disadvantage to food producing households that sell the staple only to buy it at higher prices later in the deficit season.

The WPI also generally increased both before and after the reforms. The increase before the reforms (1990 to 1993) was modest, estimated at about 23% per annum. However, there was a higher rate of increase after the reforms, ranging from 47% in the early years to about 90% annually in later years. The wage index used is based on the minimum

public sector wages, but these are not strictly reinforced in the rural areas, and the actual wages received are much lower. Therefore, this index may not be a true reflection of the purchasing power of rural workers.

The CPI's rate of increase was low (below 100%) during the pre-reforms period (1991) but rapid after the reforms in 1993 (about 269% between 1991 and 1993). However, later (1999 to 2001) the rate of increase was reduced to about 35% per year. This index varies from one socioeconomic income group to another, but the low income group used for Nairobi is assumed to have a similar basket (dominated by cereals) to that for rural areas.[4] The increase in the CPI is an indication that food prices have been on the increase since the reforms, but the rate of increase of the prices is lower for the later years than for the early years of reforms. This might mean that policy reforms may have disrupted the stability of prices in the early years, but that prices stabilized after five or so years of reform implementation.

In conclusion, most households in Kenya depend on food purchases to meet their needs. This is largely determined by the sources of household incomes. However, due to the poor performance of the agricultural sector, most rural households rely on off-farm incomes, which, unfortunately, have also increased at a relatively lower rate than consumer prices. The declining household incomes and dependence on food purchases observed in Kenya explain the increasing food insecurity for most households. Although food supplies may be available through imports, households are unable to purchase the food because their incomes are limited, particularly income from agriculture and agriculture-related activities. The majority of the rural poor also spend most of their incomes on starch-based foods (cereals), which are

[4] The CPI reported by the Central Bureau of Statistics is for Nairobi and no data are available for the CPI of the rural areas.

relatively cheaper than protein- or fat-based diets. However, the dependency on starchy foods is responsible for the high malnutrition levels in the country, particularly in rural households.

The poor try to cope with food stress by borrowing, begging or relying on relief food, especially in drought prone-areas. As a result redistribution of income and food, and remittances are important features in the food strategies for the poor. However, these strategies are not sustainable. The poor are concentrated in marginal or overexploited high potential agricultural land. This means that strategies that will enhance agricultural production could also support the food security status of the rural poor. Policy reforms that have affected the macroeconomic performance of the Kenyan economy leading to weak purchasing power have also contributed to food insecurity in most households.

# 7. Conclusions and Policy Options

## 7.1 Conclusions

Agriculture is an important sector in generating income and creating employment for rural households in Kenya. The sector contributes to economic growth, foreign exchange earnings and industrialization of the economy. The sector has undergone changes over the years through policy reforms, among other factors. The reforms started in 1980s to early 1990s and were aimed at reducing the involvement of the government in economic activity and therefore allowing the economy to move towards free market operation. The policy reforms were first detailed in the Sessional Paper No. 1 of 1986 on *Economic Management for Renewed Growth* (GoK, 1986). However, it was not until 1993 that the government seriously started implementing the policy reforms. Therefore, the policy reform period considered in this study started from 1993.

The policy reforms covered monetary and fiscal, trade and agriculture sectors. Trade policy reforms focused on reduction of tariffs and elimination of non-tariff barriers. The response of agricultural production to liberalization has unfortunately been dismal. Most commodities, particularly food commodities and industrial crops declined in production. The worst decline occurred for maize, rice, milk, cotton, sisal and coffee. The mixed trend in production is attributed to a number of factors that include area expansion or contraction, yield changes due to climatic factors, technological changes and prices. Climatic factors such as drought are important in explaining Kenya's agricultural performance, but the major factors are policy-related; they include poor coordination and sequencing of liberalized policies. The instability in world market prices has also contributed to the poor performance. Therefore, both supply constraints and implementation

of the liberalized policies are responsible for the poor performance of Kenya's agriculture.

About 75% of Kenya's population live in rural areas and depend on agriculture for their livelihoods. Most of the people are concentrated in the high and medium potential agricultural areas of central and western Kenya. The sources of food security for the rural people are on-farm production and purchases using farm and off-farm income. However, the majority of the people are net food buyers. The main sources of farm income are the crops and livestock products that are sold by households. About 50% of the rural farming households are involved in off-farm income-generating activities and about 36% have at least one salary earner living away from the farm. Furthermore, a third of the households receive remittances. Therefore, most rural people depend on non-farm activities for a significant portion of their incomes. However, these activities are closely linked to the agricultural sector. Data on changes in income indicate that there has been a shift in the contribution of household incomes from dominance of farm income in 1982 to off-farm incomes for most regions in Kenya. The contribution of farming activities to household incomes has been diminishing. Within the sources of off-farm incomes, there has been a shift from dominance of wages in 1994 towards dominance by informal business by 1997. This might be a reflection of the diminishing role of agriculture in the rural areas as a major source of employment and therefore source of income.

The decline in the performance of the agricultural sector may be responsible for the decline in household incomes and the consequent dependence on off-farm incomes. Food supply and food security at the national level have been on the decline and the country is increasingly depending on imports for its food needs. However, the overall supply of food nutrients has also declined, indicating that nationally, food

insecurity has increased. The capacity to import food has also declined, making the country more food insecure. This is despite the policy reforms that favour imports, implying a declining ability by the country to purchase food.

Most households depend on food purchases to meet their needs. This is largely determined by the sources of household incomes (farm or off-farm). The declining household incomes and dependence on food purchases observed in Kenya explain the increasing food insecurity for most households. Although adequate food may be available through imports, households are unable to purchase the food because their incomes are limited, particularly income from agriculture and agriculture-related activities. The poor try to cope with food stress by borrowing, begging and relying on relief food, especially in the drought-prone areas. As a result, redistribution of income or food through remittances is an important feature in food strategies for the poor. Such strategies are however not sustainable.

## 7.2 Policy options

Given that both supply constraints and poor implementation of liberalized policies are responsible for the poor performance of Kenya's agriculture, the country needs to reconsider increasing the use of domestic support measures allowed within the WTO agreement on agriculture to allow the agricultural sector to develop adequately. Market access concerns such as reduction of domestic tariffs and export subsidies have had an impact on imports into the country, while market access into developed countries has not expanded much. These are issues the country needs to pursue in its multilateral trade agreements. Implementation of liberalized polices should be harmonized and coordinated to avoid adverse effects on the sector. The linkages between the performance of the agricultural sector and household incomes are

such that when the performance of the sector is poor, household incomes go down. This is because although the role of agriculture in directly contributing to household incomes is diminishing, the close link between rural off-farm job opportunities in such areas as agro-processing and manufacturing and marketing of farm inputs means that agriculture still plays a leading role in the welfare of rural households.

The country's dependence on food imports has increased due to decline in domestic production. However, national food security is also endangered because the country has a weak base of sources of income to import food, which depend mainly on agricultural exports. Therefore, trade in agricultural commodities is a major determinant of national food security as much as domestic food production is. Policies that affect both domestic agricultural production and international agricultural trade are therefore important for food security in Kenya.

The dependence of rural households in Kenya on food purchases to meet their needs means that food security at household level is affected by the ability to generate incomes (both farm and non-farm). However, due to the poor performance of the agricultural sector, most rural households rely on off-farm incomes, which unfortunately have also increased at a relatively lower rate than consumer prices. The declining household incomes and dependence on food purchases in Kenya explain the increasing food insecurity for most households. Although food supplies may be available through imports, households are unable to purchase the food with their limited income sources, particularly from agriculture and agriculture-related activities.

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**Appendix table 1: Average agricultural income per annum (Ksh) and by category and proportions (%) (1986 = 100)**

| Region | 1982[a] | 1994 | | | | | | 1997 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Total crop income | Livestock sales | Livestock products | Other income[b] | Own consumption[c] | Total agric. income | Total crop income | Livestock sales | Livestock products | Other income | Total agric. income |
| Central | 6,410 | 4,153.35(50) | 799(10) | 421.685(5) | 59.09(1) | 2,877(35) | 8,310 | 749.895(31) | 539.37(23) | 1,073.9(45) | 31.37(1) | 2,394.526 |
| Coast | 4,876 | 3,125.18(54) | 721.6(12) | 99.2657(2) | 63.76(1) | 1,781(31) | 5,791 | 280(16) | 1,004.6(56) | 214.32(12) | 302.1(17) | 1,801.053 |
| Nyanza | 4,142 | 1,688.81(27) | 1,602(26) | 129.849(2) | 60.39(1) | 2,668(43) | 6,149 | 258.526(20) | 478.11(38) | 204.63(16) | 324.4(26) | 1,265.684 |
| Western | 4,578 | 2,869.11(38) | 1,560(21) | 505.918(7) | 72.83(1) | 2,507(33) | 7,514 | 322.947(19) | 632(38) | 360(22) | 350.1(21) | 1,665.053 |
| Rift Valley | 10,112 | 5,766.74(36) | 2,902(18) | 926.825(6) | 130.1(1) | 6,128(39) | 15,853 | 376.632(3) | 1,757.7(14) | 1,0395(82) | 197.5(2) | 12,727.16 |
| Eastern | 77,830 | 1,494.95(24) | 1,882(30) | 218.229(4) | 109.6(2) | 2,486(40) | 6,190 | 291.368(22) | 606.11(46) | 295.16(22) | 130.9(10) | 13,23.579 |

Notes

[a]The 1982 statistics did not disaggregate income into various categories.

[b]Other farm income includes land sales, interest, sale of home-brewed alcoholic drinks and crop products like flour, fishing, etc.

[c]Own consumption includes income forgone from crop, livestock and livestock products produced for subsistence.

*Source: Economic Survey (various)*

**Appendix table 2: Average non-agricultural income per annum (Ksh) by category and proportions (%) (1986=100))**

| | | 1994 | | | | 1997 | | | |
|---|---|---|---|---|---|---|---|---|---|
| Province | 1982[a] | Wages/profits | Informal business[b] | Remittances[c] | Other non-agric. income[d] | Wages/profits | Informal business | Remittances | Other non-agric. income |
| Central | 6,410 | 4,153(76) | 799 (15) | 422(8) | 59(1) | 2,337(23) | 6,750 (65) | 750 (7) | 539 (5) |
| Coast | 4,876 | 3,125(78) | 722(18) | 99(2) | 64(2) | 1,447(19) | 4,704(63) | 280 (4) | 1,005(14) |
| Nyanza | 4,142 | 1,689(49) | 1,602(46) | 130(4) | 60(2) | 2,167(27) | 4,995(63) | 259(3) | 478(6) |
| Western | 4,578 | 2,869(57) | 1,560(31) | 506(10) | 73(1) | 2,036(22) | 6,104(67) | 323(4) | 632(7) |
| Rift Valley | 10,112 | 5,767(59) | 2,902(30) | 927(10) | 130(1) | 4,977(25) | 12,877(64) | 377(2) | 1,758(9) |
| Eastern | 7,783 | 1,495(40) | 1,882(51) | 218(6) | 110(3) | 2,019(25) | 5,028(63) | 291(4) | 606(8) |

Notes:
Figures in parentheses are percentages (%) of income in each category.
[a]The 1982 statistics did not disaggregate income into various categories.
[b]Informal business refers to revenue from non-agricultural business as well as from cash and in-kind revenue from informal activities.
[c]Remittances are income transfers either in kind or cash.
[d]Other non-agricultural income includes pensions, rent, fees, interest, etc.

*Source: Economic Survey (various)*

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