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# Food Security in Africa

Siddig A. Salih



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# **Food Security in Africa**

Concepts, Measurement, Policy and Reality

**Siddig A. Salih**

**UNU World Institute for Development Economics Research (UNU/WIDER)**  
A research and training centre of the United Nations University

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## GLOSSARY OF ACRONYMS

ACC/SCN	Sub-Committee on Nutrition of the United Nations Administration Committee on Coordination
ADB	African Development Bank
AERC	African Economic Research Consortium
CFA	Communauté Financière Africaine
CGIAR	Consultative Group on International Agricultural Research of the World Bank
CV	Coefficient of Variations
DEEP	Development Education Exchange Papers
ECA	United Nations Economic Commission for Africa
ECCAS	Economic Community of Central African States
ECOWAS	Economic Community of West African States
EST	Eastern Standard Time
FAO	Food and Agriculture Organization
ha	Hectare
IFPRI	International Food Policy Research Institute
IGADD	Inter-Governmental Authority for Drought and Desertification
IMF	International Monetary Fund
INRA	Institute of Natural Resources in Africa
kg	Kilogrammes
MT	Metric Ton
NLTPS	National Long Term Perspective Studies
OAU	Organization of African Unity
PTA	Preferential Trade Area
R & D	Research and Development
SADCC	South African Development Coordination Conference
SAPs	Structural Adjustment Programmes
SSA	Sub-Saharan Africa
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNSO	United Nations Sudano-Sahelian Office
USAID	United States Agency for International Development
USDA	United States Department of Agriculture
WHO	World Health Organization
WRI	World Resource Institute

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## PREFACE

Economic research on global food supplies has been always diverse and multi-dimensional. The role and potential of the food producing sectors, and the basic problems caused by the supply constraints, were issues which dominated research in the early parts of this century. This approach looked at the technological and economic capabilities of the agricultural sector, the rate of growth of the total and per capita agricultural output, and the changing structure and geographical patterns of agricultural and especially of food production. Research work, dealing with the growing population and the increasing food needs has been developing and, in fact, oscillating between two extremes in the past decades: one which approached the issues from the perspectives of the changing effective demand for food; and the other from the aspects of the changing physical needs of the people. The first approach defined potential demand as a function of population and income growth. Researchers, looking at the future volume and patterns of the effective demand for food, devoted great attention to the changes of per capita income level, its impact on the share of food in the total consumer expenditure, and its changing composition towards a better and more balanced diet. The entitlement approach could be, in fact, in certain ways also related to the 'effective demand' concept, as a deliberate policy to reduce famine through increasing the income for the poor. The other extreme looked at the food supply issues basically from the perspective of the basic nutrition requirements of individuals in the given country, and combined it with the expected increase of population. It has become increasingly understood that, in public policies aiming at the achievement of sustainable food security, a complex and multi-dimensional approach is needed.

Research on the availability of food supplies for the growing global population has been an important component of the programme of the United Nations University, practically since its foundation. The research programmes of the UNU have dealt in the past with the problems of food supplies in global, regional and national perspectives and in different dimensions. The programmes in the past have also been related to some other issues, like population growth, nutrition norms, socially appropriate food and agricultural technologies, poverty, national policies and international responses. The research work revealed the role of different factors and the intensity of interlinkages between some of them. Most of the past research programmes were implemented in cooperation with some other national or international institutions. The tasks of research on the improvement of global food security have been formulated explicitly in the first 'Medium Term Perspectives' of the UNU, in 1982. The programme intended to identify the optimal mix of policies for food security on regional, national and local level, as well as the specific tasks of families and individuals. It focused, however, chiefly on nutrition issues. UNU/WIDER's programmes, in the past, have dealt in this context mainly with the causes and effects of famine, the interrelations between poverty and hunger, and with the search for national policies which could improve the food situation of the poor. The research programme focused mainly on South Asia. Other regions of

the world were dealt with in a much less systematic way. Today Africa, and especially Sub-Saharan Africa (SSA), is in a very difficult situation.

This study of Dr Siddig Salih, a Senior Research Fellow at UNU/WIDER, is an important policy-oriented contribution to the analysis and the solution of the problems of food security in a macroeconomic dimension. It is a part of a much broader research project, which he is conducting on 'Resource Mobilization and Sustainable Growth in Africa'.

The food problems of Africa have had traditionally many specificities compared to other continents. The causes of the differences between Africa and other continents could be found of course in the natural environment – about 40 per cent of the continent is desert and another 40 per cent is savannah. Africa is about 21 per cent of the earth's surface, and the combined flow of rivers is about 7 per cent of the combined flow of the world's rivers to the oceans. Evaporation in many parts of the continent exceeds surface rainfall. Groundwater is naturally distributed in an extremely unequal fashion. Water pollution has become a very serious problem in many countries.

Research on African agriculture has revealed that human cultivation activities in Africa, especially during the second half of the 20th century, had a devastating effect on the life-sustaining capacity of the continent. Now as we approach the end of the 20th century the accumulation of the environmental problems has reached a critical level in many countries. The burning of the forests, the patterns of land use, and animal husbandry contributed to the deterioration of the soil. Population on the other hand increased very fast. It trebled between 1900-1960 and it will treble again within the 40 years between 1960-2000. By 2000, about 30 per cent of the poor in the developing world, close to 270 million people, will live in Africa (whereas in 1985 the figure was 15 per cent).

After the World Food Congress of 1974, which proposed global nutritional surveillance, there was meaningful progress in measurement and monitoring of food consumption patterns and the nutrition status of the African population. The methodology for surveillance of nutrition status and food availability has been refined on both national and family level by UNICEF, FAO and WHO. Crucial information has been gained on the basis of the regular monitoring, which also serves as a source for studies and for policy-formation related to food security within a number of African countries. According to the results of this monitoring and the research based on it, close to 40 per cent of the population of SSA is facing the realities of food insecurity.

Dr Salih's work draws attention to factors related to the shortcomings of agricultural policies, pricing, marketing, taxation, the neglect of investments in agrotechnology, infrastructure, research and extension. All these indicate that there is no single nor simple answer to the food security problem. Certain measures must be related to the environmental sustainability of agricultural output, others to the patterns of land tenure, or to agricultural policy incentives. All these require a better understanding of the realities, much sounder methodological foundations, and improved utilization of the accumulated knowledge in the given area.



This contribution of Dr Salih, which I recommend to the reader, with its macroeconomic orientation to the theoretical and practical analysis of the food security problems in Africa, is not only an interesting and useful piece of research on conceptual and measurement issues, but could also help in the formation of policies by facilitating a better understanding of the diverse and difficult African realities in a comparative way: the sources of a few success stories, the failures of certain policies, the degree of dependence on food aid, the need for new approaches in national policies and international actions, the traditional and new constraints, the evolving opportunities offered, for example, by regional cooperation in food supplies by improving the utilization of food, and maybe in the longer run the changes in the traditional eating habits. This latter option may become extremely important in the growing urban areas. The rapidly changing human settlement patterns in Africa open a new dimension also in the patterns of food supplies and consumption, making the improvement of food security an even more urgent task than in the past, predominantly rural, environment of the continent.

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# I INTRODUCTION

The beginning of the 1990s saw a decline in per capita food levels in 80 per cent of all Sub-Saharan African (SSA) countries. This is not surprising since Africa is the only continent in the world which has experienced a decline in food production per person over the past three decades. Despite the high population growth rate, the trend in Africa's food output compared with the rest of the world reflects significant differences in output performance as well as population growth rates. The increasing supply instability (in particular, cereals) over time has compounded the gravity of the food shortages. Consequently, more than 70 per cent of all SSA countries have been unable to meet the minimum dietary requirements in the late 1980s through to the mid-1990s. The situation is more serious in east and southern Africa where 85 per cent of all countries recorded low and declining dietary intake far less than the minimum calorie standard required for survival. As a result, more than 70 per cent of the African population lack the basic needs for a minimal diet, shelter or clothing. Alarm has been expressed again because of severe food shortages resulting in further increases in deaths from starvation-related causes and acute malnutrition only in SSA.

The roots of food and poverty crises date back to colonial days when Africa was exploited as a source of cheap raw materials. The limited range of food policy and the specialization of African economies in international exchange of primary commodities have not been fundamentally changed.

Despite a strong response of exports to policy reforms, African countries were unable to absorb terms of trade losses that resulted in a secular decline in the purchasing power of exports. Consequently, the capacity to finance commercial imports became substantially limited, in particular, at the realm of scarce foreign exchange. Food aid was unstable and is currently reduced to half its level in the mid-1970s. Concurrent with the decline in food supply, and in particular, cereals, there has been a shift from traditional food staples (primarily bananas, cassava, maize, millet, plantains and sorghum) to non-traditional food (mainly rice and wheat) in the African diets. The substitution phenomenon is worsening the food insecurity situation, since it is occurring in countries facing severe foreign exchange constraints and/or is occurring in countries where rice and wheat production is costly. Hence, making the objective of food self-sufficiency difficult to fulfil, at least in the short-run.

A shift of priority towards drought-tolerant domestically produce crops (cassava, millet and to a lesser extent sorghum) would have a much greater beneficial impact on food security than imported non-traditional grains. Cassava, millet and sorghum are produced and consumed in 40 African countries. More importantly, production of these commodities requires few production skills or inputs and they have recorded reasonable yields under adverse environmental conditions; in particular, cassava. Cassava is

considered a famine crop, or a crop that prevents famine where it is grown. Millet and sorghum are not only the main food staple in more than 30 African countries, their increasing use in nutritionally improved wheat flour mixes has reduced the wheat import bill by 30 per cent.

It is widely agreed that without using adapted sustainable technology and improved plant stocks, per capita food production is likely to stagnate or continue declining in Africa. There are theoretical and empirical rationales for considering technological advances in food staples as public goods (or in general, R & D). In addition, they should be provided by the public sector to stabilize food production if the costs of intervention are not larger than the benefits. Indeed, observed production instability has been associated with countries that cut back in agricultural research, development and extension services; in particular, countries facing frequent supply shocks (droughts, wars and civil unrest). A fundamental lesson to be learned from Asia's success in food security is that all Asian governments from Japan to Indonesia gave early priority to raising the productivity of rice (the main food staple) to ensure food security. There is no compelling reason for African countries not to follow this path sooner rather than later. The study argues the case for stabilizing food production as the main component of the farmers' entitlements. The reason is obvious. World market prices of primary commodities (African exports) are more unstable than food prices (in particular, prices of the main food staples). In turn, export earnings become highly unstable, thus destabilizing the entire macroeconomy at the height of ongoing economic reforms. It is, therefore, essential to include in the analysis of the macroeconomic stabilization policies the ramification of food security in terms of the stability of food production and/or their prices. That is, the benefits of stabilizing food staples (and consequently, food purchasing power) are considerably larger than the expected cost of restructuring incentives in favour of food production in Africa.

The focus on food security has another distinguishing factor: it provides an important rationale for investing in agriculture. Investment policies need to be designed in ways that build upon the complementarity of food and crop production. The emerging empirical evidence in support of the complementarity hypothesis between food and cash crops in several African countries attests to this strategy. Indeed, investing in rural infrastructure to improve the efficiency of domestic food marketing will ultimately result in an improved agricultural marketing system. If these institutional factors can be overcome, the continent has sufficient land and water resources to feed its population provided that the following policies are given the priority they deserve. First, barriers to intra-African trade must be removed to permit food deficit countries access to food surpluses of others. Second, agricultural research must be strengthened to provide access to improved inputs for farmers. Third, the government should simultaneously invest in the quality of land with the view of enabling farmers to manage and till the land efficiently. Without appropriate investments in research, infrastructure and incentives, it is difficult to achieve and sustain food security in Africa.

A major conceptual conclusion to be drawn from the analysis of food insecurity in the region is that entitlement determination represents a basic shift in addressing food security in Africa from a short-term crisis management to a long-term perspective. In

turn, potential policy options were broadened to improve food security in Africa; from reversing the historical production trend alone to a whole range of trade, inputs, investment, land management and diversification of the sources of income and entitlements.

The study attempts to assess food insecurity in Africa over the last three decades. At the methodological frontier, the study reconciles the definitional debate of food security with the appropriate indicators required to assess food problems in section 2. The most striking difference between this study and the majority of the surveys on food security issues is the attempt to widen the scope of the short-run definition and to integrate its indicators in the long-term concept of food security given the severity and uniqueness of Africa's food problems. Consequently, the relevant measurement of food security in the long-run is extended to cover both the demand and supply issues. Section 3 assesses quantitatively food insecurity based on regional aggregates, sub-regional and country-level magnitudes for East and Southern, West and Central and North Africa. Factors that might have explained food insecurity problems and the varying degrees of sub-regional food insecurity are also analyzed in section 3. The empirical findings and the reality facing all African countries provide essential ingredients to suggest a wide range of consistent policy options and a future path for Africa to sustain food security. These controversial issues are discussed in section 4. Section 5 concludes by relating the set of desirable future policies required to realize and exploit both the static and the acquired comparative advantage of the continent with long-term constraints on food security. We may succeed in identifying the necessary tools to stabilize food production and facilitate agricultural development, but it remains to be seen how it is done; that is, a serious test has yet to be made.

## II CONCEPTS AND DEFINITION OF FOOD SECURITY

### 2.1 Definition of food security

Since Malthus' days, almost two centuries ago, food problems and food security have been formulated on whether food production can keep pace with population growth. The dismal performance of the world food production in the 1980s and the poor harvest of the early 1990s have revived interest on the neo-Malthusian persuasion (Myers 1991; King 1992; Ehrlich *et al.* 1993; Brown *et al.* 1991, 1994 and the literature cited in Dyson 1994 and Norse 1994).<sup>1</sup> Consequently, the definition and the measurement of food security evolved around the Malthusian fears. The common short-run definition of food security in a single country or in the world at large is the ability of food-deficit countries, or regions within countries, or households within these countries to meet target consumption levels on a year-to-year basis (for example, Valdés 1981:2 and Bigman 1985:6 among others).

The target consumption levels are represented in the literature by a constant: a level of average per capita consumption (trend) and/or a person's minimum caloric intake (energy requirements). That is, the choice of the target level determines the measure of the food security. In practice, the severity of the food problem, in the demand-driven approach, is measured by two indicators. The first of these is the expected food gap which is defined as the difference between actual average consumption per capita in any given year and a normal year (or trend) level of average per capita consumption.<sup>2</sup> The second indicator is food insecurity which is defined as the probability that in any given year actual food consumption will fall below a minimum daily requirement level, employing nutritional criteria. The nutritional aggregate measure focuses on the energy intake required to maintain the body weight of an individual, which was determined by the World Health Organization (WHO) and the Food and Agriculture Organization (FAO) of the United Nations as the minimum requirement of about 2350 calories per day. Despite some nutritionists' doubts, this measure is widely used by the World Bank, the FAO and many food analysts.<sup>3</sup>

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<sup>1</sup> There is growing evidence in the literature to support such a claim (for example, Agacoili and Rosegrant 1994; ECA 1994; Garcia 1994; Norse 1994 and Nygaard 1994 and Virji and Schram 1994).

<sup>2</sup> Computationally, the measure is obtained by multiplying the probability that per capita consumption in the future year would fall below its normal year (trend) level, by the size of the gap. Reutlinger and Selowsky (1976) have estimated the food gap for several countries. However, their estimate is based on the caloric deficiencies of the undernourished people only. For detailed discussions on the use of the trend level of consumption as the target, interested readers may refer to Valdés (1981) in particular Chapters 1 and 2:1-52.

<sup>3</sup> Srinivasan (1977, 1981); Ehrlich *et al.* (1983) and Bigman (1985) among others summarized the nutritionists' concern that a single standard of calorie needs (based on an *ad hoc* base for body weight for men 60 kg and for women 52 kg) fails to take into account interpersonal differences attributable to age,

FAO publishes updated calculations of per capita food availability derived from food balance sheets and based on national averages. The average per capita availability in developing countries is lower than that in developed market economies. The former is estimated to provide 93 per cent of the defined energy requirements and 115 per cent of the requirements for the latter (FAO/WHO 1973 and FAO 1982).<sup>4</sup> In essence, the national average per capita caloric intake determines the number or the proportion of undernourished people for each country. Although the FAO and the World Bank have attempted to take account of some personal characteristics in defining undernutrition, undernutrition has been considered as a proxy for undernourishment in the literature.<sup>5</sup> In addition, other objections have been raised to reflect the extent and the scope of undernourishment. Consequently, the philosophy and dimensions of food security have been influenced by Sen's (1991) concept of entitlement. The corresponding definition of food security has been adopted by the United Nations; in particular the Sub-Committee on Nutrition of the United Nations Administration Committee on Coordination (UN ACC/SCN 1991:6).

In this long-term equilibrium view, food security is defined as access by all people at all times to enough food for an active, healthy life (Bigman 1985; World Bank 1986; Osmani 1988; Maxwell 1989; Drèze and Sen 1989; Sen 1991; Braun *et al.* 1992; Teklu 1992; Ali 1993; Chen and Kates 1994; ECA 1994; Salih 1994a; Schulthes 1994 and Virji and Schram 1994 among others). The essential elements of this definition are the emphasis on both the demand (access) and the supply (availability) of food. Hence, food insecurity is simply the lack of access to enough food. The elaboration on the definition and the underlying conceptual framework of this approach focuses attention on issues ignored in the previous definitions. These are the distinctions between transitory and chronic insecurity, inequalities in the distribution of income and wealth, seasonality and inter-annual variation and the functionality of an adequate diet.

Transitory food insecurity is a temporary decline (or shortage) in a country's or households' and/or regions' within the country access to enough food. These shortages may result from instability in food production, food prices, incomes, etc. The continuation of these shortages or persistence of inadequate diet caused by the inability to acquire food results in chronic food insecurity. Hence, poverty is considered the root

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body size, level of activity patterns, climate and the like. They also argue that an inadequate intake of calories is not the only cause of undernutrition.

<sup>4</sup> Bigman (1985) assumed the minimum level necessary for survival and adequate health to be equal to 90 per cent of the normal year level of average per capita consumption. While USAID (1994) recorded the international minimum standard for survival of 2100 calories per person per day and the standard for an adequate diet of 2400 calories a day.

<sup>5</sup> Although the two concepts are tied, this study will contrast the two concepts following Drèze and Sen's (1989:14) implicit distinction. Undernutrition is usually seen as a shortage of food calorie intake, while undernourishment is taken to mean an unsatisfactory state of being. It follows immediately that the former is connected with commodities (in particular, consumed food relative to the nutritional standard), while the latter is connected with the state of human beings (for example, a person being somehow inadequate in energy or strength or some other feature associated with nutritional sufficiency).

cause of chronic food insecurity (Braun *et al.* 1992:6 and Virji and Schram 1994:2).<sup>6</sup> That is, chronic food insecurity is the continuous inability either to buy enough food or to produce one's own food. Thus, the definition provides a testable hypothesis of food security; namely, the availability and stability of both consumption and production or the arguments in these functions.<sup>7</sup>

## 2.2 Measurement of food security

Several indicators have been utilized in the literature to capture the multiple dimensions of (short-term versus long-term and transitory versus chronic) food insecurity. The most widely used indicators are:

1. Food security at the continent and sub-regional levels can be examined by equating the adequacy of the regional nutritional requirements in per capita dietary calories with the sufficiency of available food supply (Chen and Kates 1994:193). The ultimate goal is to meet the food requirements of the population; assuming equal access by all sub-regions and social classes to the available supply over time.<sup>8</sup>
2. Similarly, food security at the country level can be analyzed by supply and demand nexus.<sup>9</sup> The most widely used indicators are quantities of available food versus needs and net import needs versus capacity to import (Braun *et al.* 1992:7).

Food output and its availability is not only a major source of food supply in Africa, it is also a source of income and livelihood for the majority of the African population (Drèze and Sen 1992:33 and Salih 1994a:7). Hence, availability and variability of food supplies received more attention in the food security literature in Africa (for example, USDA 1979; Lele and Candler 1981; Johnson 1981; KIT 1984; Salih 1986; Kumar 1988; Hay and Rukuni 1988; Franzel *et al.* 1989; Rukuni *et al.* 1990; Jayne and Rubey 1993; DEEP 1994; ECA 1994; Magadza 1994; Neun and Yade 1994; Prudencio and Al-Hassan 1994; Salih 1994; USAID 1994; UNDP 1994; Walubengo 1994 and the World

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<sup>6</sup> Although transitory food insecurity can result in famine, famine is frequently associated with large and persistent food shortages (Chen and Kates 1994:194). Indeed, it is the chronically food insecure who are mostly affected by transitory food insecurity problems. People can also suffer from famine because of their inability to have access to food even when food is available (Drèze and Sen 1989:34).

<sup>7</sup> The interpretation of the general hypothesis of the entitlement approach offered by Osmani (1993) attests to this fact. That is, famine can be caused by declining food availability because it worsens the entitlement of a person. Of course, factors other than food availability decline can also cause famine by worsening the entitlement mapping; for example, instability in food prices, production or the purchasing power.

<sup>8</sup> Food supply in each period is defined as the sum of the current level of food production, net food trade including food aid, and releases from food stocks during the period.

<sup>9</sup> In this context, world food security can be viewed as the ability of all countries to achieve and sustain their own national food security.



Bank 1989, 1995). The modified availability approach suggests that causes of food insecurity are associated frequently with fluctuations in food supply from an aggregative perspective (Johnson 1981:257).

3. At the household level, food security is measured directly by actual dietary intake of all household members using the standard household expenditure and income surveys (Salih 1986:12; Salih and Affan 1986:101; Braun *et al.* 1992:7 and Chen and Kates 1994:193).<sup>10</sup> The degree of household food security also depends on the minimal nutritional requirements of individuals, with the assumption that all households within each income/expenditure stratum have the same entitlements to food (Salih and Affan 1986:105 and Chen and Kates 1994:193). Such a measure tends to ignore non-economic factors such as storage facilities, transport networks, weather, health, sanitation, forms of food rationing and other entitlement programmes. More seriously, food indicators obtained from household surveys measured the existing situation during the survey period but not the changes in socioeconomic and demographic variables. The level and changes in these variables must be updated continuously to monitor food security (Braun *et al.* 1992:7).

4. Individual food security is typically analyzed by a food poverty indicator and/or anthropometric information. The measure of food poverty (sometimes referred to as household access) is defined as the number of individuals living in households whose access to food is measured by income, expenditures, or consumption sufficient to provide a dietary intake adequate for growth, activity and good health (Ali 1993:5 and Chen and Kates 1994:195). Empirical evidence suggests that undernutrition has increased in Africa, using the food-poverty indicator, while it declined rapidly in Asia and Latin America (Ali 1993:10; Chen and Kates 1994:196 and Saran 1994:71). The second indicator of actual body measurements (anthropometry) is closely related to the nutritional status at the individual level. That is, individual food security implies an intake of food and absorption of nutrients sufficient to meet differential individual needs for activity, health, growth and development. The level of need is determined primarily by an individual's age, gender, body size, health status and level of physical activity (Chen and Kates 1994:193).

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<sup>10</sup> Food security at the household level can, to some extent, be equated with the sufficiency of the households' entitlements. The entitlements can be measured directly from the budget surveys by adding-up the bundle of food-production resources, income available for food purchases, remittances of nationals working abroad and gifts or assistance given to all members of the household (Salih 1986:16).

### III FOOD INSECURITY IN AFRICA

#### 3.1 Dimension of the regional food problems

Africa's chronic food shortages have become synonymous with its economic malaise. Per capita incomes, and therefore food purchasing power, have declined annually in SSA since the beginning of the 1980s at an average rate of 1.6 per cent and the short-term economic prospects are not encouraging (Salih 1994:23 and World Bank 1994:22-23). Africa also has the fastest rate of population growth in the world estimated at slightly above 3 per cent annually (Drèze and Sen 1989:32; ADB 1992:5; ECA 1994:5 and Salih 1994b:9). However, food production grew only by an average of 1.8 per cent; indicating that food output per head in Africa has declined steadily since the 1960s (Table 1, Figure 1 and ECA 1994:5). Africa was the only region in the developing regions of the world to record an index of food output per head in excess of 100 per cent during the decades of the 1960s through the 1970s (Table 1). Although food output per head has increased steadily in the developing countries as a whole and in particular in Latin America and Asia since the early 1960s, the index declined rapidly in Africa. In fact, Africa was the only region in the world plagued by production problems over nearly two decades to the extent that the declining food output per head failed to reach 100 per cent in the 1980s through the beginning of the 1990s (Table 1 and Figure 1).

TABLE 1  
INDEX OF REGIONAL FOOD PRODUCTION PER HEAD (IN PER CENT)  
(1979-81 = 100)

Region	Average for			
	1960s	1970s	1980s	early 1990s
World	92.8 (2.4)	97.4 (2.1)	102.6 (1.8)	105.0 (1.1)
Developing Countries	91.2 (2.6)	95.8 (2.0)	106.4 (3.6)	115.4 (0.7)
Asia	86.2 (3.8)	93.8 (3.3)	109.2 (5.0)	122.6 (1.3)
Latin America	95.3 (1.2)	96.2 (2.7)	101.9 (2.6)	106.2 (1.0)
Africa	115.8 (1.3)	109.0 (6.1)	96.6 (2.9)	95.2 (2.1)

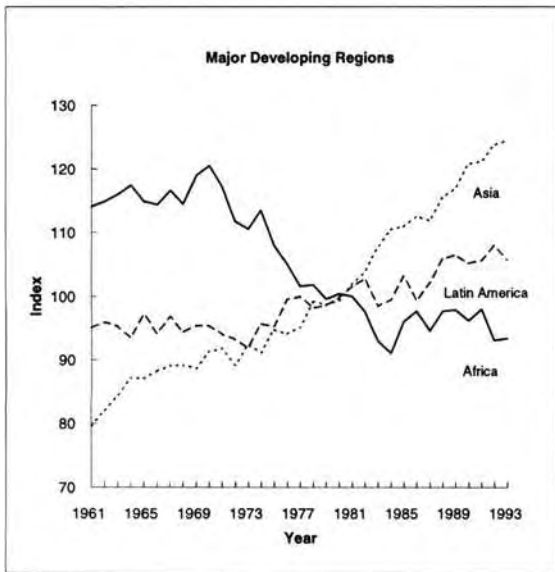
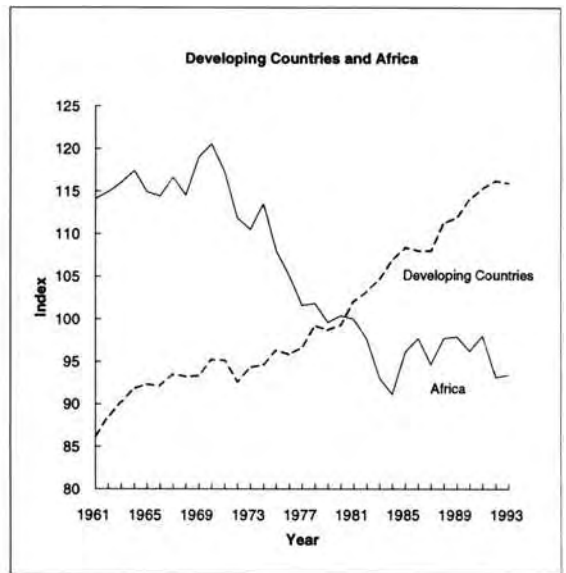
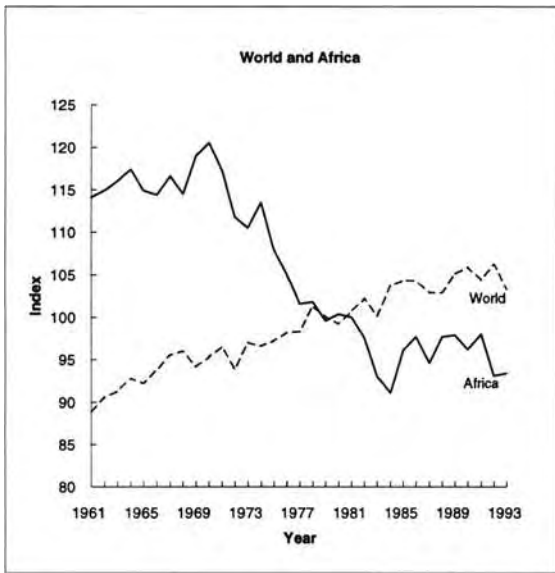
Notes:

Averages of per capita food production and their corresponding coefficient of variations (C.V.) have been calculated from Table A1 in the Appendix. C.V. are enclosed between brackets. C.V. is defined as the sample standard deviations divided by its arithmetic mean.

Despite the high population growth rate, the contrasting trend of food output in Africa vis-à-vis other regions of the world reflects significant differences in output

FIGURE 1. REGIONAL PER CAPITA FOOD PRODUCTION, 1961-93

(1979-81 = 100)



Source:

Table A1 in the Appendix.

performance rather than population growth rates (Drèze and Sen 1989:33 and Salih 1994a:6). More alarming, in this indicator, is both the deteriorating stability over time and the higher degree of production instability in Africa relative to the rest of the world, using the coefficient of variation (C.V.) as an indicator of variability. While stability of food production improved over time in other developing regions, the observed variability increased in Africa from nearly 10 per cent during 1961-79 to more than 11 per cent during 1980-93 (Tables 1 and 2). That is, the observed variability in food production is slightly over 11 per cent for Africa compared to less than 3 per cent in other developing regions (Table 2).<sup>11</sup>

Although food production includes cereal and non-cereal staples, it is the higher variability in cereal production that explains most of the observed variance in total food production; in particular during the period 1980-93. Empirical evidence suggests that fluctuations in staple food production, follow closely the fluctuations of total food production. This is particularly true for Africa but not generally for Asia and Latin America, as indicated by the estimated coefficient of variations, thus confirming the general rule of food security (Table 2).<sup>12</sup> Indeed, average annual per capita cereal production in Africa decreased from 165 kg in the early 1960s to 137 kg in the early 1990s. The rate of decline in per capita cereal production is equivalent to the average annual rate of decline of 0.6 per cent in per caput food production in the continent (Tables 1, A1 and ECA 1994:5). The shortages have usually been made up by massive cereal imports. For example, cereal imports rose steeply from 24 million tons (34 per cent of total supply) in 1980 to 37.6 million tons (40 per cent of total supply) in 1992; at an annual rate of increase of 4.7 per cent during 1980-92 (FAO 1993:79 and ECA 1994:6). Wheat accounts for more than half of the cereal imports during the same period.

The annual food import bill for Africa represents more than 30 per cent of its agricultural export earnings (UNCTAD 1993:A10; ECA 1994:6 and USAID 1994:6). After a brief rise in the terms of trade and export volumes for Africa during the late 1970s and early 1980s, real prices of export declined steadily through the early 1990s (Figure 1 and Salih 1994b:5).<sup>13</sup> The decline in terms of trade coupled with poor export

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<sup>11</sup> The fluctuations in various regions rarely occur in unison. As a confirmation to the elementary statistical property, fluctuations for the world as a whole are uniformly much less than for any one region.

<sup>12</sup> The general empirical rule states that for most countries, fluctuations in staple food consumption follow closely the fluctuations of domestic staple food production (Valdés and Konandreas 1991:33-34). It is to be noted that the higher variability of cereals production reflects a high share of cereals in total food rather than the differences in the degree of freedom used in the calculations of the coefficient of variations (C.V.) (Table 2). The estimated C.V. for the sample period 1980-93 are more relevant, uniform and comparable to the estimates in Table 2 than those reported in Table 1.

<sup>13</sup> At present, nearly 90 per cent of African exports consists of a few primary commodities, virtually the same proportion as in 1965. The structure of SSA exports has been remarkably stable and more than 80 per cent of African countries, particularly the poorest, depend on three agricultural commodities. Hence, reliance on the export of a few commodities has made African economies highly sensitive to conditions in those product markets (Salih 1994b:4).

TABLE 2  
INDEX OF AGRICULTURE, FOOD AND CEREALS PRODUCTION IN AFRICA, 1961-93  
(1979-81 = 100)

Year	Agriculture	Food	Cereals
1961-1965*	69.2	67.5	N.A.
1966	74.7	73.6	N.A.
1967	77.5	76.3	N.A.
1968	79.9	78.8	N.A.
1969	80.8	79.5	N.A.
1970	82.4	81.2	N.A.
1971	84.1	83.6	95.8
1972	85.7	84.4	93.4
1973	87.0	85.5	80.6
1974	92.2	90.9	94.2
1975	93.9	93.1	96.8
1976	93.2	92.9	96.1
1977	93.5	93.0	90.5
1978	96.2	96.2	97.6
1979	97.2	97.1	93.5
1980	99.9	99.3	100.5
1981	99.5	102.9	106.5
1982	107.7	103.6	101.5
1983	103.3	101.4	89.8
1984	102.9	102.9	90.2
1985	111.4	111.5	115.0
1986	116.2	116.6	121.9
1987	116.2	117.6	112.0
1988	123.1	123.9	129.0
1989	125.7	126.5	134.7
1990	127.9	129.0	125.1
1991	133.8	135.3	141.5
1992	130.7	132.4	120.9
1993	135.0	136.7	135.5
C.V. in 1961-79	9.5%	10.1%	5.2%
C.V. in 1980-93	10.6%	11.2%	13.8%
C.V. for the World	7.9%	2.0%	7.9%
C.V. for Asia	13.0%	2.6%	10.6%
C.V. for Latin America	8.8%	2.4%	9.5%

Source:

FAO. 1976-1993. Production Yearbook, Vols. 30-47, Tables 4, 5 and 8, pp. 39-85, Food and Agriculture Organization of the United Nations, Rome.

Notes:

N.A. indicates not available.

\* indicates average for 1961-1965.

C.V. abbreviates the coefficient of variations, as defined in Table 1.

performance, resulted in a secular decline in the purchasing power of exports (or income terms of trade) in Africa relative to other developing regions (Figure 2). In fact, the income terms of trade in other developing regions improved during the 1980s through the 1990s (Figure 2). With food imports increasing sharply and earnings from primary exports diminishing, the capacity to finance commercial imports became substantially limited. In addition to meeting the rising debt obligations, scarce foreign exchange had to be diverted from essential expenditures to pay partly for food imports.

The above considerations suggest that Africa had to rely increasingly on food aid in the short-run, in particular at the realm of chronic undernourishment. Africa is the only region in the world where the absolute number of chronically undernourished persons increased by 5 per cent annually in the late 1980s until the early 1990s and is expected to increase rapidly between now and 2010 (Ali 1993:10 and ECA 1994:14).<sup>14</sup>

There is an emerging consensus among policymakers, the international community and the majority of analysts concerned with food security in Africa that attainment of an acceptable growth rate in per capita food production is a prerequisite for sustainable food security in Africa (Drèze and Sen 1989:134; World Bank 1989:89; ADB 1992:162; FAO 1993c:50; ECA 1994:5; Norse 1994:134; Salih 1994a:17 and USAID 1994:15).

Both the availability and the entitlement approach to food security seemed to agree not only in the high correlation between food and agricultural sectors, but also in the leading role of agricultural production as the major source of income and livelihood for vast sections of the African population. The high correlation between food and agricultural production is confirmed in Figure 3. The decline in per capita food production (and the consequent decline in per capita agricultural production) will also reduce the income of at least 60 per cent of the population in Africa.<sup>15</sup> However, the observed decline in per capita food output in Africa need not have resulted in a collapse of food entitlement, if that decline had been compensated by an expansion of alternative incomes usable to acquire food from other sources, e.g. through food aid and/or imports (Drèze and Sen, 1989:33). This is the case for Africa as a whole, in particular in the 1980s when the average calorie intake has improved and consequently food consumption was relatively stable around 3.5 per cent, measured by the coefficient of variations (Table 3). However, the improvement in caloric intake over the threshold level of 2200 calories was short-lived and has been reversed since 1989 to the extent that daily average caloric intake in Africa fell below 90 per cent of all other developing regions in the 1990s. Low caloric intake is also shared by Eastern, Southern, Central and Western Africa in the 1990s. North Africa is the only sub-region to register an average caloric intake of 2700 calories (in excess of the WHO/FAO's minimum caloric

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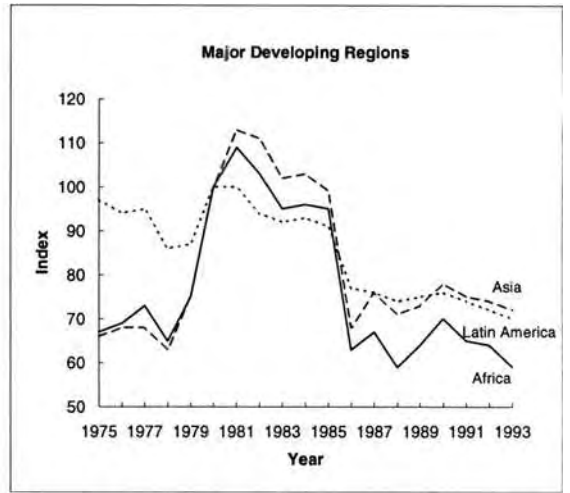
<sup>14</sup> Undernourished persons are those whose average food consumption levels are below the threshold of 2200 calories per person per day. At this level an individual will not be able to support light activity. The number of undernourished persons almost doubled from 94 million in 1969-71 to 175 million in 1988-90 and is expected to reach 300 million by 2010 in SSA (ECA 1994:14).

<sup>15</sup> Agriculture employed more than 70 per cent of the labour force, accounted for 40 per cent of GDP and the agricultural population represents 60-90 per cent of total population in the majority of African countries (World Bank 1980:224; ADB 1992:28-29 and Salih 1994b:7).

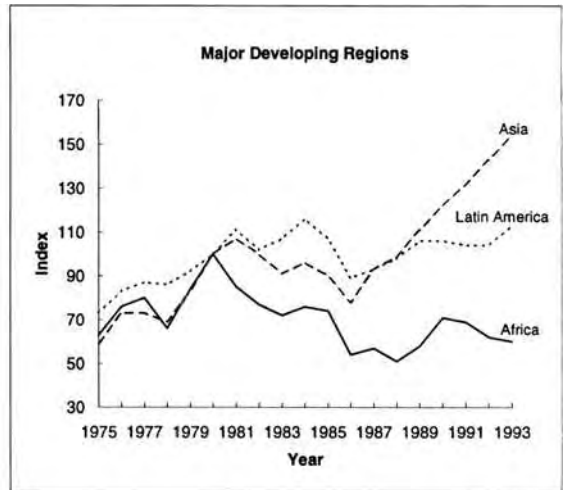
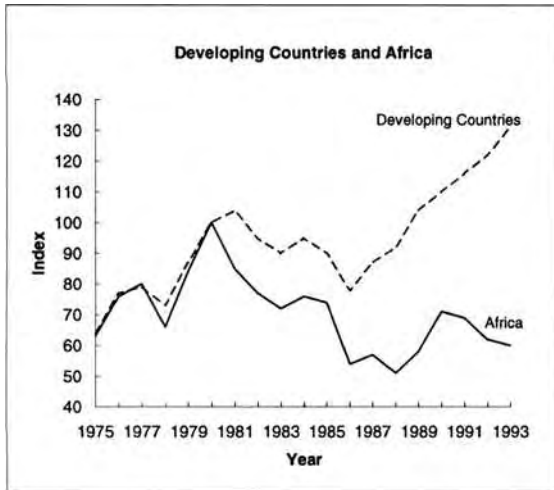
FIGURE 2. PRICE AND INCOME TERMS OF TRADE, 1975-93

(BASE YEAR 1980 = 100)

a. Terms of Trade Indices



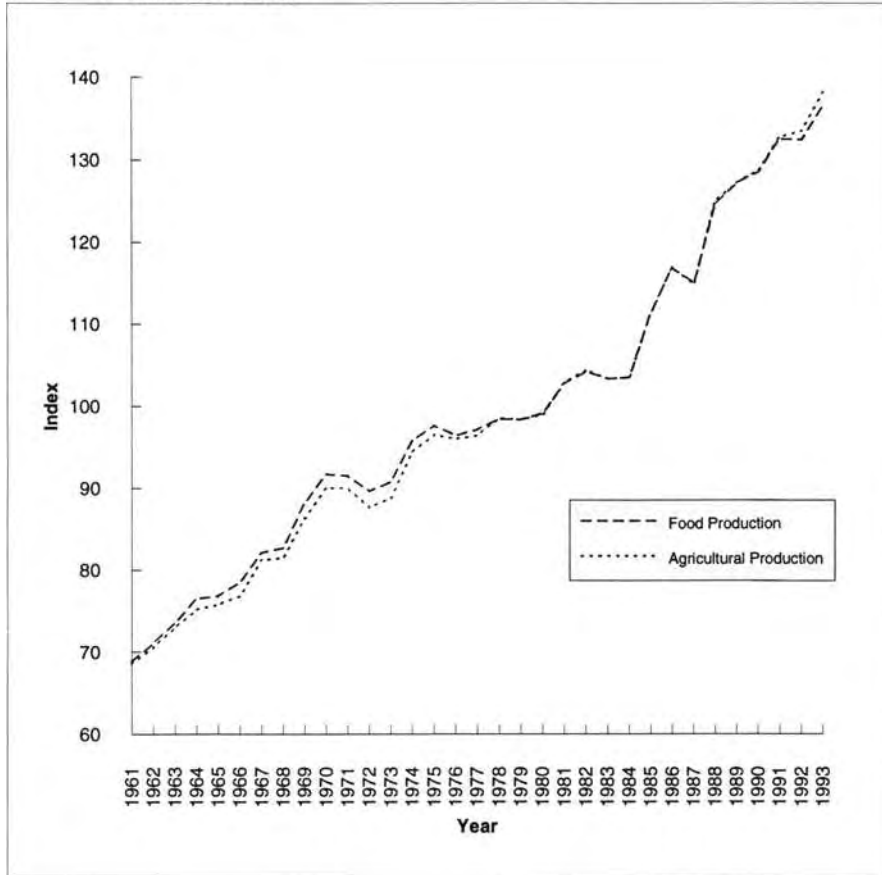
b. Exports Purchasing Power



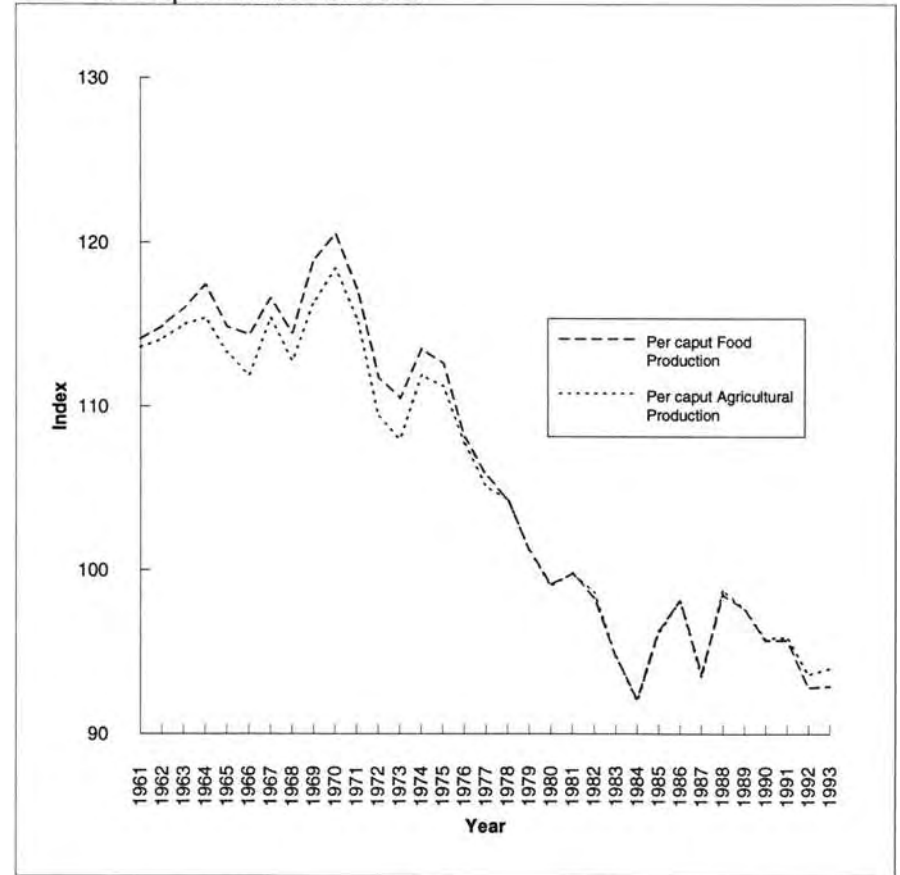
Source: Table A1 in the Appendix.

FIGURE 3. INDEX OF FOOD AND AGRICULTURAL PRODUCTION IN AFRICA  
(1979-81 = 100)

a. Production Index



b. Per Capita Production Index



Source: Table A1 in the Appendix.



TABLE 3  
CALORIES PER CAPUT PER DAY IN AFRICA, 1965-91  
(FAO FOOD BALANCE SHEET)

	1965	1970	1975	1980	1985	1990	1991	C.V.
<b>Africa</b>	2092	2154	2181	2270	2281	2177	2118	3.5%
% of the World	92	88	..	85	..	82	..	
% of Developing Countries	109	101	..	94	..	89	..	
% of Latin America	89	85	..	81	..	81	..	
% of Near East	95	88	..	77	..	75	..	
% of Far East	116	106	..	97	..	90	..	
% of Other Developing Countries	100	93	..	90	..	84	..	

Sources:

ADB. 1992. African Development Report, Table 40, Appendix A42, African Development Bank, Abidjan.

FAO. 1992. Production Yearbook, Vol. 46, Table 3, pp. 21-25, Food and Agriculture Organization of the United Nations, Rome.

FAO. 1991. Production Yearbook, Vol. 45, Table 106, pp. 237-238, Food and Agriculture Organization of the United Nations, Rome.

World Bank. 1989. Sub-Saharan Africa: From Crisis to Sustainable Growth, Table 33, p. 276, The World Bank, Washington, D.C.

Notes:

.. means not available.

C.V. abbreviates the coefficient of variations, as defined in Table 1.

requirements) in the 1990s. Recent estimates confirmed *inter alia* that SSA has the highest food-energy-deficient population in the developing world (Braun *et al.* 1992:13).<sup>16</sup>

### 3.2 Food insecurity at sub-regional and country levels

Four-fifths of all African countries, for which data was available, recorded stagnating or falling levels of per caput food consumption in the early 1990s (Table 4). Nevertheless, sub-regional differences were significant. All countries in North Africa recorded average dietary intake in excess of the required minimum caloric intake in the 1980s through the 1990s. By contrast, in SSA about three-quarters of all countries

<sup>16</sup> The incidence of food-energy deficiency was 38 per cent in SSA, 35 per cent in Asia, 26 per cent in South America and 23 per cent in Central America (Braun *et al.* 1992:13).

TABLE 4

AVERAGE DAILY CALORIES PER CAPUT IN SUB-REGIONS AND AFRICAN COUNTRIES, 1965-91

	1965	1970	1975	1980	1985	1987	1988	1989	1990	1991	C.V.
<b>EAST AND SOUTHERN AFRICA</b>	<b>2030</b>	<b>2070</b>	<b>2033</b>	<b>2145</b>	<b>2045</b>	<b>2042</b>	<b>2039</b>	<b>1923</b>	<b>1835</b>	<b>1762</b>	<b>5.86%</b>
<b>Core Group</b>	<b>2165</b>	<b>2183</b>	<b>2253</b>	<b>2275</b>	<b>2275</b>	<b>2233</b>	<b>2233</b>	<b>2081</b>	<b>1982</b>	<b>1907</b>	<b>5.95%</b>
Burundi	2048	2348	2398	2304	2340	2389	2436	2253	2070	1887	8.10%
Kenya	2289	2249	2230	2225	2268	2071	2027	1973	1919	1865	7.50%
Lesotho	2065	2013	2044	2400	2312	2299	2295	2307	2319	2331	6.30%
Madagascar	2462	2460	2523	2491	2379	2410	2400	2101	1805	1509	15.20%
Malawi	2244	2360	2473	2406	2397	2258	2195	2009	1823	1637	12.60%
Namibia	..	..	..	..	..	..	..	1889	..	..	..
Tanzania	1832	1882	2134	2310	2246	2186	2172	2151	2144	2130	7.00%
Uganda	2360	2240	2207	2151	2296	2444	2548	2013	1800	1750	12.00%
Zambia	2094	2129	2334	2227	2126	2108	2098	2026	1954	1881	6.10%
Zimbabwe*	2105	2194	2049	2137	2168	2139	2146	2232	2318	2404	4.80%
<b>Small Economies</b>	<b>2160</b>	<b>2228</b>	<b>2311</b>	<b>2309</b>	<b>2336</b>	<b>2377</b>	<b>2388</b>	<b>2399</b>	<b>2410</b>	<b>2420</b>	<b>3.64%</b>
Comoros	2296	2217	2096	2074	2107	2110	2111	2113	2115	2116	3.20%
Seychelles	1735	1901	2162	2306	2261	2210	2180	2150	2120	2089	8.10%
Swaziland*	2100	2266	2482	2482	2511	2588	2610	2631	2652	2674	7.40%
Reunion	2401	2561	2690	2820	2951	3003	3029	3058	3082	..	8.60%
<b>Social Unrest</b>	<b>1890</b>	<b>1951</b>	<b>1802</b>	<b>2006</b>	<b>1803</b>	<b>1837</b>	<b>1831</b>	<b>1749</b>	<b>1669</b>	<b>1595</b>	<b>6.78%</b>
Angola	1897	2030	1905	2177	1956	1818	1740	1725	1710	1694	8.50%
Ethiopia	1824	1714	1553	1806	1604	1728	1749	1658	1567	1476	6.90%
Mozambique	1979	2064	1901	1810	1573	1575	1558	1632	1705	1778	10.30%
Rwanda	1665	2029	1992	2007	1874	1786	1741	1786	1891	1875	6.50%
Somalia	2167	2224	1973	2099	2008	2120	2136	1736	1336	1100	20.30%
Sudan	1938	2213	2090	2417	2178	2125	2102	1996	1890	1785	8.70%
<b>Outliers</b>	<b>2135</b>	<b>2207</b>	<b>2346</b>	<b>2411</b>	<b>2463</b>	<b>2483</b>	<b>2502</b>	<b>2458</b>	<b>2414</b>	<b>2370</b>	<b>5.09%</b>
Botswana	2019	2115	2115	2152	2244	2251	2276	2269	2262	2255	4.10%
Mauritius*	2272	2316	2618	2715	2721	2755	2767	2679	2592	2506	6.80%
<b>CENTRAL AND WEST AFRICA</b>	<b>2148</b>	<b>2164</b>	<b>2113</b>	<b>2169</b>	<b>2137</b>	<b>2171</b>	<b>2196</b>	<b>2094</b>	<b>2004</b>	<b>1914</b>	<b>4.17%</b>
<b>Core Group</b>	<b>2145</b>	<b>2141</b>	<b>2073</b>	<b>2183</b>	<b>2096</b>	<b>2137</b>	<b>2165</b>	<b>2070</b>	<b>2001</b>	<b>1931</b>	<b>3.77%</b>
Gambia*	2194	2313	2108	2154	2353	2495	2599	2703	2807	2913	11.50%
Ghana*	1950	2218	2162	1795	1707	1811	1864	2209	2552	2895	17.80%
Guinea*	1923	1986	1885	1906	2128	2244	2302	2042	2336	2630	11.20%
Mauritania*	2064	2002	1815	2065	2278	2359	2398	2528	2658	2788	13.50%
Nigeria*	2185	2140	2075	2254	2143	2169	2192	2039	1888	1737	7.60%
<b>CFA</b>	<b>2136</b>	<b>2154</b>	<b>2126</b>	<b>2198</b>	<b>2237</b>	<b>2283</b>	<b>2312</b>	<b>2192</b>	<b>2073</b>	<b>1953</b>	<b>4.83%</b>
Benin	2009	2160	1999	2041	2193	2176	2167	2145	2123	2100	3.40%
Burkina Faso	2009	1998	1993	2029	2085	2225	2311	2061	1812	1562	10.30%

Table 4 (continued)

	1965	1970	1975	1980	1985	1987	1988	1989	1990	1991	C.V.
Cameroon*	2079	2180	2323	2130	2040	2018	2007	2161	2315	2469	7.00%
Central African Rep.	2135	2177	2254	2136	1927	1970	1992	1980	1968	1956	5.60%
Congo	2259	2153	2326	2472	2609	2637	2655	2512	2369	2225	7.50%
Côte d'Ivoire	2360	2393	2310	2546	2563	2582	2603	2365	2128	1890	9.50%
Gabon	1881	1917	2050	2274	2508	2555	2587	2396	2207	2019	11.90%
Mali	1859	1860	1785	1720	2033	2135	2196	2181	2168	2154	9.20%
Niger	1994	2012	1974	2363	2363	2457	2507	2340	2175	2011	9.40%
Senegal	2479	2360	2267	2401	2321	2373	2396	1989	1582	1176	20.20%
Togo	2378	2361	2083	2178	2225	2189	2172	2133	2094	2055	5.00%
<b>Small Economies</b>	<b>1897</b>	<b>1985</b>	<b>2018</b>	<b>2038</b>	<b>2060</b>	<b>2038</b>	<b>2019</b>	<b>2418</b>	<b>2446</b>	<b>2476</b>	<b>10.14%</b>
Cape Verde*	1767	1879	2179	2567	2744	2690	2663	2635	2607	2580	14.70%
Guinea-Bissau*	1910	2003	1972	1806	1763	1759	1745	2360	2418	2477	14.30%
São Tomé & Príncipe	2186	2160	1900	2297	2365	2299	2261	2223	2184	2146	5.80%
<b>Social Unrest</b>	<b>2180</b>	<b>2242</b>	<b>2204</b>	<b>2093</b>	<b>2105</b>	<b>2106</b>	<b>2114</b>	<b>2007</b>	<b>1901</b>	<b>1794</b>	<b>6.69%</b>
Chad	2399	2200	1817	1799	1740	1772	1832	1852	1872	1892	10.60%
Liberia	2154	2209	2242	2375	2376	2385	2390	2270	2152	2033	5.50%
Sierra Leone	1837	1960	1937	2034	1894	1820	1785	1806	1827	1848	4.30%
Zaire	2187	2282	2288	2123	2163	2168	2173	2034	1896	1757	8.00%
<b>NORTH AFRICA*</b>	<b>..</b>	<b>2310</b>	<b>2585</b>	<b>2888</b>	<b>3065</b>	<b>3133</b>	<b>3168</b>	<b>3011</b>	<b>2855</b>	<b>2699</b>	<b>9.89%</b>
Algeria*	..	1817	2196	2648	2689	2746	2776	2726	2676	2625	12.70%
Egypt*	..	2471	2678	3019	3316	3369	3395	3213	3031	2849	10.60%
Libya*	..	2507	3599	3640	3609	3593	3586	3384	3184	2984	12.10%
Morocco*	..	2440	2576	2761	2855	2974	3034	2820	2609	2398	8.30%
Tunisia*	..	2285	2634	2748	2949	3038	3083	2964	2845	2726	8.80%

## Sources:

ADB. 1992. African Development Report, Table 40, Appendix A42, African Development Bank, Abidjan.

FAO. 1992. Production Yearbook, Vol. 46, Table 3, pp. 21-25, Food and Agriculture Organization of the United Nations, Rome.

FAO. 1991. Production Yearbook, Vol. 45, Table 106, pp. 237-238, Food and Agriculture Organization of the United Nations, Rome.

World Bank. 1989. Sub-Saharan Africa: From Crisis to Sustainable Growth, Table 33, p. 276, The World Bank, Washington, D.C.

## Notes:

.. means not available.

\* denotes above the required minimum caloric intake of 2350 calories recommended by WHO/FAO in the 1990s.

C.V. abbreviates the coefficient of variations, as defined in Table 1.

TABLE 5

## MAJOR FAMINES AND DROUGHTS IN AFRICA SINCE THE LATE 1960s

Years	Sub-regions and Countries Affected
1968-74	Djibouti, Nigeria (Biafra), Somalia, Sudano-Sahelian zone of West Africa and in particular Burkina Faso, Chad, Mali, Mauritania, Senegal
1972-74	Ethiopia, Nigeria (Hausaland)
1973-75	Niger
1974-76	Angola
1977-78	Zaire (Bas-Fleuve)
1980-82	Kenya (Turkana), Uganda (Karamoja)
1982-85	Angola, Burkina Faso, Ethiopia, Malawi, Mali, Mauritania, Mozambique, Niger, Tanzania, Uganda
1984-85	Chad, Mozambique, Sudan
1987	Ethiopia, Mozambique
1988	Somalia, Sudan
1991	Ethiopia, Liberia, Mozambique, Sudan
1992	Eritrea, Ethiopia, Liberia, Mauritania, Mozambique, Sierra Leone, Somalia, Zaire and Southern Africa Sub-region
1993	Angola, Burundi, Chad, Liberia, Rwanda, Ethiopia, Eritrea, Kenya, Somalia, Sudan, Zaire and Southern Africa Sub-regions and in particular Angola, Mozambique, Tanzania
1994	Southern Africa Sub-region

## Sources:

Braun *et al.* (1992:14).  
 FAO (1993:13), (1994:13).  
 USAID (1994:2).

## Notes:

Drought of the late 1970s and early 1980s affected a few countries in East and South Africa (e.g. Djibouti, Ethiopia, Kenya, Tanzania and Uganda) and effected more countries between 1988-94 i.e.g. Burundi, Eritrea, Ethiopia, Kenya, Rwanda, Somalia, Sudan, Tanzania, Uganda and the remaining countries of the Sahel and Southern Africa region (USAID 1994:2).

Sahel of West Africa comprises both inland and coastal countries of Burkina Faso, Cape Verde, Chad, Gambia, Guinea-Bissau, Mali, Mauritania, Niger and Senegal (Reardon 1993:31).

recorded an average daily caloric intake less than the international standard for an adequate diet of 2350 calories per day. More than two-thirds of all the countries in Central and West Africa recorded less than the minimum dietary requirements in the early 1990s (Table 4). Problems of consumption instability have compounded the gravity of the situation; observed consumption variability in 16 out of 23 countries in Central and West Africa were found equal to or above the 7 per cent cut-off point as reported in Valdés and Konandreas (1981:30).<sup>17</sup> Only seven countries in Central and West Africa have either improved their average caloric intake or reached an adequate diet (Table 4). Four out of the seven countries belong to the core group of countries adopting Structural Adjustment Programmes, SAPs, (i.e., 80 per cent of the countries in the core group) and two of the successful countries are small countries with a population of less than a million persons.<sup>18</sup> The situation is more serious in East and Southern Africa where 17 out of 20 countries (or 85 per cent of all countries) for which data was available, recorded declining and low per capita caloric availability below the international minimum standard required for survival (Table 4). The extremely low levels of dietary intake of the 1990s are significantly below those attained in the earlier decades of the 1960s and the 1970s. The critical food problems of East and Southern Africa are widely reported in the news and the specialized international institutions (for example, DEEP 1994:7; FAO 1982-94:4-14; ECA 1994:12-13; IFPRI 1994:4-5; UNDP 1994:1; USAID 1994:6-7 and World Bank 1995:1, among others). Severe food shortages are emerging, deaths from starvation-related causes and acute malnutrition are only increasing in SSA countries (Table 5; Braun *et al.* 1992:13; FAO 1993:11 and USAID 1994:2). Fourteen countries in Africa are currently facing exceptional food emergencies and half of these countries are also being affected by civil strife (FAO 1994:12). Natural disasters and in particular repeated occurrences of drought in the Horn of Africa since 1984 and Southern Africa since 1991/92 have had the severest effect on food production in Eastern and Southern Africa in the late 1980s through the early 1990s (Tables 5, 6 and A2 in the Appendix; Magadza 1994:167; Salih 1994a:11 and USAID 1994:8).<sup>19</sup>

The decline of per capita food production in Africa was uneven among the major areas. During the period from the early 1980s to the early 1990s, food production per caput showed an increasing trend in North, West and Central Africa at a rate of 1.1 and 0.9 per cent annually, respectively (Tables 6 and A2 in the Appendix and Figure 4). The gains in food production in North, West and Central Africa were not enough to offset

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<sup>17</sup> In the sample analyzed by Valdés and Konandreas, two-thirds of the developing countries had consumption variability equal to or above 7 per cent (Valdés and Konandreas 1981:30-31).

<sup>18</sup> The World Bank classified SSA countries into four main categories: a core group of countries considered successful adjusters; also adjusting countries members of the Communauté Financière Africaine (CFA); small economies with a population of less than one million each; and countries with social unrest. The remaining countries (Botswana and Mauritius) graduated from SAPs are considered outliers (Salih 1994b:21). Since South Africa is considered a developed market economy, it is treated as a separate group in this study (UNCTAD 1993:A10 and FAO 1994:10).

<sup>19</sup> The drought inflicted considerable damage in the communal lands which resulted in high levels of vulnerability to food deficit communities; primarily due to crop failures and precious water resources (Magadza 1994:185 and Maphosa 1994:55).

the overall decline of per capita food production in Africa. Food production per caput in East and Southern Africa has been declining at an alarming rate of 1.6 per cent annually

TABLE 6

PER CAPUT FOOD PRODUCTION IN THE MAJOR AFRICAN SUB-REGIONS, 1961-93  
(IN PERCENTAGE, BASE YEAR 1979-81 = 100)

	1961-79	1980-93	1980-86	1987-93	1990-93
<b>EAST AND SOUTHERN AFRICA</b>	90.2 (14.3%)	(6.3%)	96.7 (3.7%)	88.3 (5.1%)	85.4 (4.2%)
Core Group	106.6 (3.5%)	(5.7%)	98.0 (3.1%)	91.3 (5.7%)	88.1 (5.2%)
Small Economies	99.1 (5.7%)	(7.0%)	101.5 (3.4%)	92.4 (6.7%)	88.7 (6.8%)
Social Unrest	106.7 (3.1%)	(9.0%)	93.8 (5.9%)	81.4 (5.1%)	79.3 (4.2%)
Outliers	124.4 (6.4%)	(7.4%)	92.5 (6.6%)	84.8 (5.0%)	83.6 (6.0%)
South Africa	98.4 (5.9%)	(12.4%)	87.6 (12.4%)	79.7 (10.1%)	74.5 (9.5%)
<b>WEST AND CENTRAL AFRICA</b>	112.1 (6.9%)	(5.3%)	98.6 (2.9%)	106.7 (4.0%)	109.5 (1.7%)
Core Group	117.0 (10.2%)	(9.9%)	98.5 (4.0%)	114.7 (7.5%)	121.0 (3.0%)
CFA	104.9 (4.2%)	(3.1%)	97.8 (3.8%)	98.6 (2.2%)	97.9 (1.6%)
Small Economies	118.2 (16.0%)	(4.6%)	108.2 (6.3%)	110.4 (1.2%)	110.6 (1.3%)
Social Unrest	109.0 (4.0%)	(1.3%)	99.9 (0.9%)	98.3 (1.2%)	97.5 (0.8%)
<b>NORTH AFRICA</b>	105.8 (4.8%)	(7.9%)	103.1 (5.1%)	117.3 (4.1%)	119.0 (4.5%)

Sources:

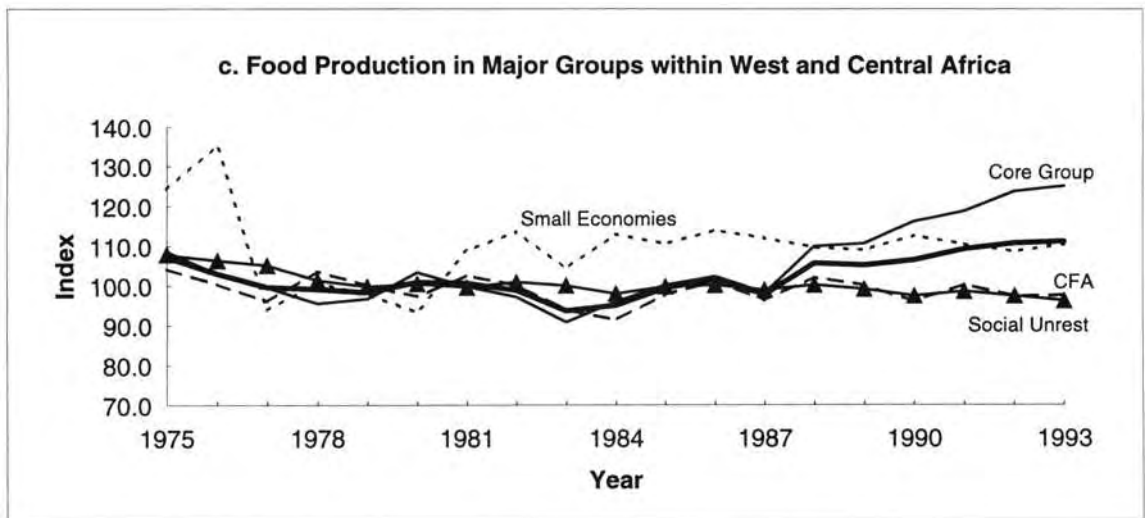
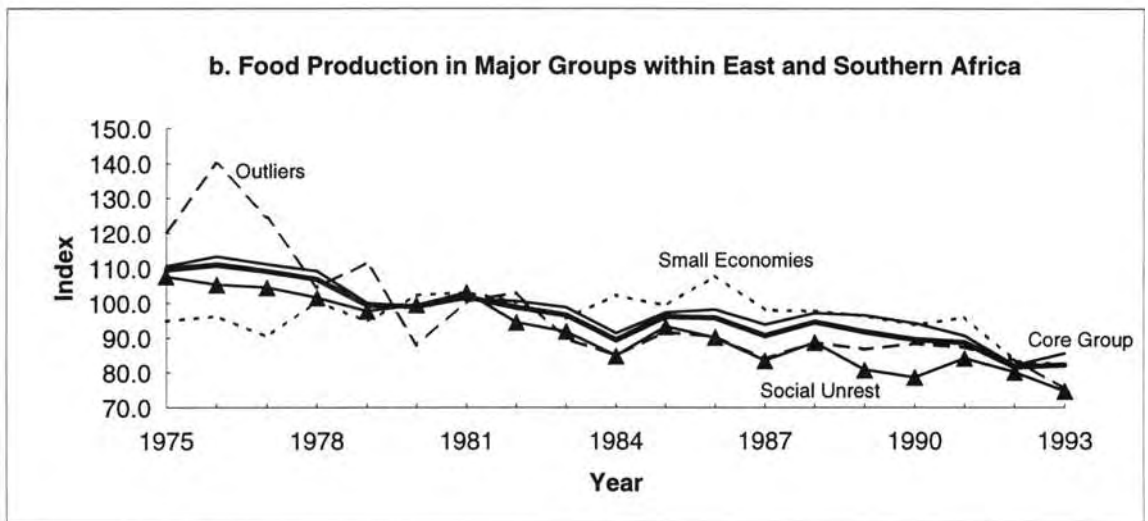
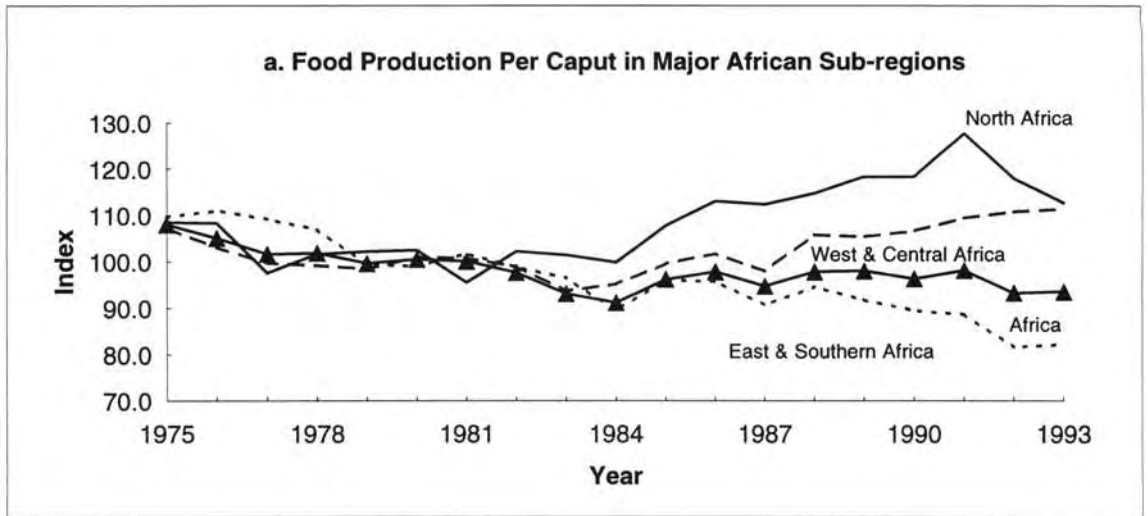
Table A2 in the Appendix.

Notes:

Means for each period were calculated from Table A2 in the Appendix.

Estimated coefficient of variations (C.V.) for each period is enclosed between brackets.

FIGURE 4. FOOD PRODUCTION PER CAPUT IN MAJOR AFRICAN SUB-REGIONS AND GROUPS, 1975-93



Source: Table A2 in the Appendix.

during the early 1980s and the early 1990s. The declining trend of per capita food production is shared by all countries, except Uganda and Mauritius, in East and Southern Africa (Figure 4 and Table A2 in the Appendix).

As expected, all countries affected by civil strife including the group of social unrest in Western Africa recorded significant losses in per caput food production during the same period. However, more than half of the countries in the CFA group, two-thirds of the countries within the group of small economies and almost all the countries within the core group of adjusters (with the exception of Mauritania) in West and Central Africa have increased food production per caput significantly during the period 1987-93 in comparison with the period 1980-86 (Figure 4 and Tables 6 and A2). Similarly, all countries in North Africa (except Libya) have improved food production per caput during the period 1987-93 compared with 1980-86. Indeed, the share of food imports and in particular cereal imports in total supply declined sharply from 35.3 per cent in 1980 to 22.8 per cent in 1992 for the core group of adjusters in West Africa and marginally for North, West and Central Africa during the same period (FAO 1993:304).

Food production has been relatively stable in two-thirds of all African countries, as their coefficients of variations are below Africa's average (Tables 2, 6 and A2 in the Appendix). Observed production instability has been associated with countries faced by meagre and unreliable rainfall in the landlocked areas (Burkina Faso, Lesotho, Namibia and Niger), countries with civil unrest or wars (Rwanda, Liberia, South Africa and Sudan) and historically food-surplus economies that are currently experiencing severe prolonged drought (Gambia, Malawi and Zimbabwe). If the unfavourable weather conditions and civil disturbances continue in these countries, food shortages will threaten vast expanses of East and Southern Africa. As a result, not only will incomes and entitlements decline in these areas, but the main source of caloric intake (cereal) will drastically deteriorate.

### **3.3 Main food staple in Africa**

Vegetable products provide 94 per cent of caloric requirements in Africa; the highest in the world over the past three decades (Table 7). All the sub-regions and the majority of African countries and in particular, large and populous countries, obtained more than 90 per cent of their caloric intake from vegetable products during the same period (Tables 7 and A3). Staple foods (cereals, roots, tubers and plantains) accounted for 60 to 80 per cent of the daily caloric intake or two-thirds to four-fifths of the caloric intake from vegetables in SSA (Tables 7 and 8). Cereals provide the bulk of the diet in Africa in particular, among large, populous countries with high degrees of consumption variability. The share of cereals alone of daily calories per caput in these countries has exceeded 60 per cent in East and Southern Africa (Botswana, Ethiopia, Kenya, Madagascar, Malawi, Somalia, Sudan, Zambia and Zimbabwe) and over 70 per cent in West Africa (Burkina Faso, Chad, Gambia, Mali, Niger and Senegal) over the past two decades (Tables 4 and 8).



Cereal production has had a negative per capita growth in the two sub-regions of SSA in the late 1980s through the early 1990s (Figure 5). The steady increase of cereal

TABLE 7

SHARE OF VEGETABLE PRODUCTS IN DAILY CALORIES PER CAPUT  
(IN PERCENTAGE OF TOTAL CALORIC INTAKE)

	1961-63	1969-71	1979-81	1988-90
<b>WORLD</b>	84.3	84.3	84.5	84.3
Developing Countries	92.7	92.4	91.6	90.3
Africa	93.5	93.2	93.0	93.6
Latin America	83.3	83.6	82.5	82.4
Near East	89.0	90.0	88.9	90.4
Other Developing Countries	89.5	88.0	88.6	87.3
<b>WEST AND CENTRAL AFRICA</b>	95.8	95.2	94.7	95.9
Core Group	96.6	96.1	94.9	96.8
CFA	93.9	93.0	93.1	93.5
Small Economies	95.8	92.3	90.3	89.8
Social Unrest	96.0	96.1	96.8	97.1
North Africa	92.3	92.0	91.6	91.6
<b>EAST AND SOUTHERN AFRICA</b>	90.1	90.1	90.0	90.1
Core Group	92.0	92.0	92.5	92.0

Note:

Calculated from Table A3 in the Appendix.

TABLE 8

AVERAGES OF DAILY PER CAPITA CALORIC INTAKE FROM STAPLE FOODS IN  
SUB-SAHARAN AFRICAN COUNTRIES IN THE EARLY 1970s (IN PER CENT)

Country	Cereals	Roots, Tubers and Plantains	Total
<b>EAST AND SOUTHERN AFRICA</b>	<b>52.0</b>	<b>16.9</b>	<b>68.8</b>
<b>Core Group</b>	<b>50.2</b>	<b>19.0</b>	<b>69.3</b>
Burundi	26.5	43.6	70.1
Kenya	57.3	11.6	68.9
Lesotho	53.2	..	53.2
Madagascar	64.4	16.6	81.0
Malawi	76.2	1.9	78.1
Namibia	46.1	14.4	60.5
Tanzania	33.9	30.3	64.2
Uganda <sup>2</sup>	29.8	31.5	61.3
Zambia	67.9	5.5	73.4
Zimbabwe	67.8	5.0	73.8
<b>Small Economies</b>	<b>58.1</b>	<b>2.3</b>	<b>60.4</b>
Swaziland	58.1	2.3	60.4
<b>Social Unrest</b>	<b>53.6</b>	<b>15.1</b>	<b>68.4</b>
Angola	32.0	37.2	69.2
Ethiopia	70.6	3.0	73.0
Mozambique	35.3	38.9	74.2
Rwanda <sup>1</sup>	18.5	56.5	75.0
Somalia	55.0	2.1	57.1
Sudan	47.3	10.6	57.9
<b>Outliers</b>	<b>59.6</b>	<b>..</b>	<b>59.6</b>
Botswana	59.6	..	59.6
<b>WEST AND CENTRAL AFRICA</b>	<b>41.2</b>	<b>9.7</b>	<b>75.9</b>
<b>Core Group</b>	<b>41.1</b>	<b>..</b>	<b>77.4</b>
Gambia	63.5	1.8	65.3
Ghana	28.8	45.3	74.1
Guinea	59.1	20.9	80.0
Mauritania	55.2	..	55.2
Nigeria	41.4	36.8	78.2

Table 8 (continued)

Country	Cereals	Roots, Tubers and Plantains	Total
<b>CFA</b>	<b>51.3</b>	<b>..</b>	<b>73.6</b>
Benin	41.6	32.0	76.3
Burkina Faso	73.7	2.5	76.2
Cameroon	36.6	31.4	68.0
Central African Rep.	22.9	52.9	75.8
Congo	12.6	65.7	78.5
Côte d'Ivoire	35.7	40.6	76.3
Gabon	6.4	67.9	74.3
Mali	76.0	1.9	77.9
Niger	70.0	..	70.0
Senegal	62.6	3.9	66.5
Togo	42.7	36.5	79.2
<b>Small Economies</b>	<b>52.1</b>	<b>16.0</b>	<b>68.1</b>
Cape Verde	56.3	7.0	63.3
Guinea-Bissau	50.5	19.4	69.9
<b>Social Unrest</b>	<b>26.5</b>	<b>49.2</b>	<b>75.7</b>
Chad	66.0	3.4	69.4
Liberia	45.9	32.3	78.2
Sierra Leone	56.0	15.5	71.5
Zaire	16.1	60.8	76.9

Source:

USDA. 1981. Food Problems and Prospects in Sub-Saharan Africa, Development Digest, United States Department of Agriculture, Vol. XIX, pp. 118-132; Table 3, p. 127 represents average of 1972-74 from the Provisional Food Balance Sheet of the Food and Agriculture Organization of the United Nations, Rome.

Notes:

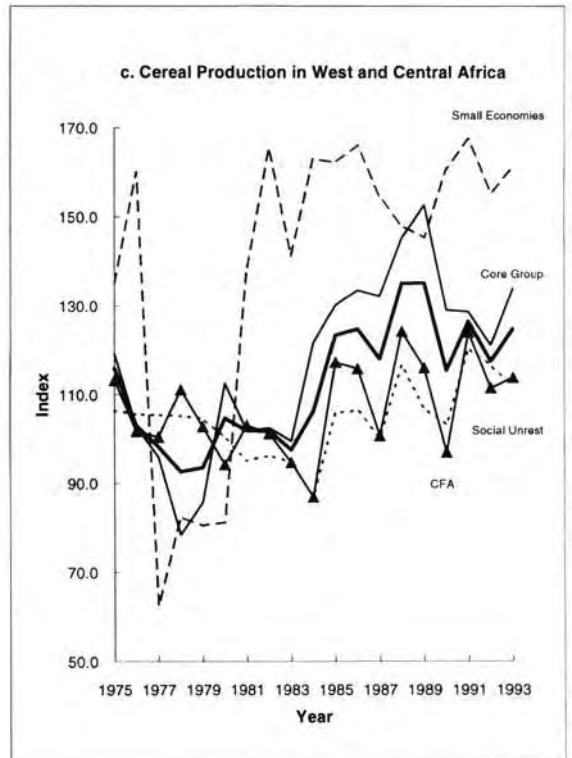
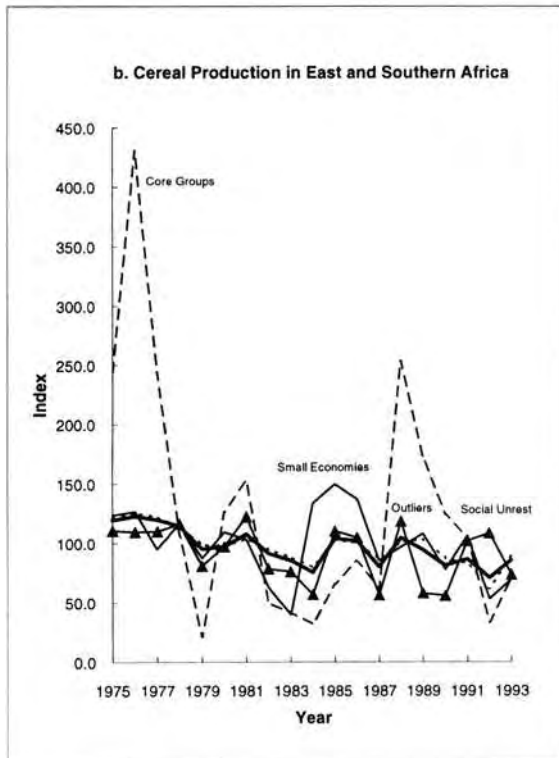
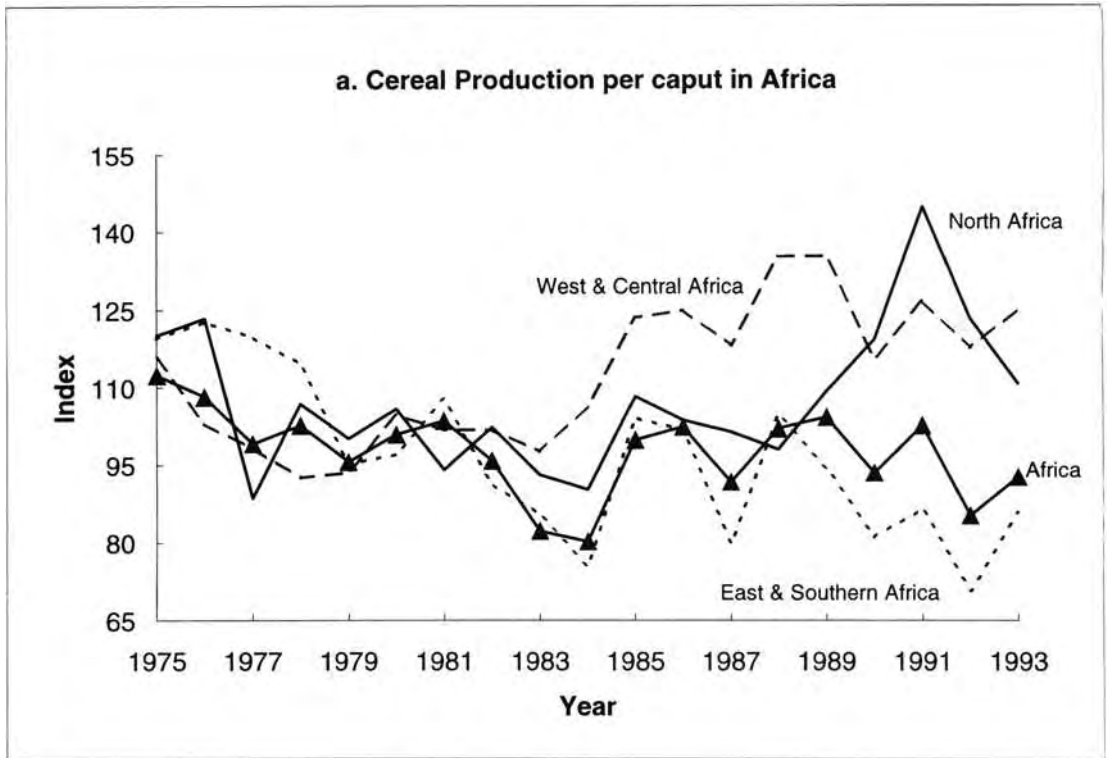
<sup>1</sup> Plantains make up 30 per cent of caloric intake.

<sup>2</sup> Plantains make up 15 per cent of caloric intake.

.. means a value less than 1 per cent.

Staple foods in Africa include cereals, roots, tubers and plantains in grain equivalent (ECA 1994:13).

FIGURE 5. CEREAL PRODUCTION PER CAPUT IN MAJOR AFRICAN SUB-REGIONS AND GROUPS, 1975-93 (1979-81 = 100)



Source: See Table A2 in the Appendix.

production in North Africa during the late 1980s was not sufficient to reverse the negative per capita growth rate in the continent. Indeed, the positive growth rate in the two regions of SSA outweighed the negative per capita growth rate in North Africa during 1992/93; hence resulting in an overall positive growth rate for the continent in 1993 (Figure 5). The stagnant and declining growth rate in the per capita cereal production in Africa was also shared by almost all the major groups within each African sub-region (except the small economies group in West and Central Africa) in particular during the late 1980s through the early 1990s (Figure 5). Consequently, the share of domestic production in the cereals supply declined in all groups of SSA countries (except the core group of adjusters in West Africa) between 1980 and 1992 (Table 9). In turn, cereal imports exceeded 30 per cent of the total supply in each sub-region and varied between 34 to 98 per cent in all groups within these sub-regions (except the core group of adjusters in West and Central Africa) in 1992.<sup>20</sup>

The decline in cereal production (and consequently the deterioration in food security) has not been helped by a marked shift in the composition of consumption from traditional food grains (primarily maize, millet and sorghum) to non-traditional grains (mainly imported rice and wheat) in the African diets during the last decade (Salih and Affan 1986:116; Reardon 1993:31; Ali 1994:66 and Kennedy and Reardon 1994:47). Maize, rice and wheat have been rapidly replacing millet and sorghum in cereals consumption in East and Southern Africa. The share of rice and wheat imports rose from 65 per cent of cereal imports in the early 1970s to 75 per cent in the late 1980s and 1990s for East and Southern Africa and SSA as a whole (Table 10, Kennedy and Reardon 1994:47 and Salih 1994a:11). Similarly, the share of domestic coarse grains in cereal consumption dropped from 87 per cent to 68 per cent in Central Africa and dropped even more by approximately 20 per cent in West Africa during the last two decades (Kennedy and Reardon 1994:47). Hidden in this aggregate consumption pattern is a rural-urban distinction. Empirical evidence from households budget surveys in several countries suggest that the bulk of cereal expenditure is allocated to traditional coarse grains (maize, millet and sorghum); i.e., rice and wheat play a minor role in the rural diets in the two sub-regions of SSA (Salih and Affan 1986:112-113; Ali 1994:71; Kennedy and Reardon 1994:48-50 and the literature cited there).<sup>21</sup> By contrast, the share of wheat in the cereal budget of urban households is higher than rural areas. Household budget surveys also reveal increasing wheat share in cereal expenditure with high income strata (Salih and Affan 1986:103 and Kennedy and Reardon 1994:50). That is, wheat can be considered a luxury good in SSA. Hence, income, prices, female labour force participation and urbanization factors have been driving the substitution in consumption towards non-traditional grains in several countries in SSA (Salih and

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<sup>20</sup> The decline in the share of imports for the core group is attributed to the significant decline in the share of cereal imports in the cereal supply of Nigeria. The latter declined from 34 per cent in 1980 to less than 15 per cent in 1992. By contrast, the share for Gambia, Ghana, Guinea and Mauritania has increased to 72, 37, 50 and 87 per cent, respectively, in 1992.

<sup>21</sup> Reported food expenditure in these surveys indicated that food expenditure (including food purchases and home grown) represents the largest share of the total household expenditures in excess of 80 per cent and cereals expenditure accounts for more than 60 per cent of the food expenditure. Such households are considered poor by international standards, that is, another indicator of poverty (Salih and Affan 1986:104-106; Ali 1994:64-65 and Kennedy and Reardon 1994:48).

TABLE 9

SHARES OF DOMESTIC PRODUCTION AND IMPORTS IN TOTAL SUPPLY OF CEREALS  
(IN PERCENTAGES OF TOTAL)

	Cereal Supply in Million M.T.		Domestic Production		Imports	
	1980	1992	1980	1992	1980	1992
<b>EAST AND SOUTHERN AFRICA</b>	30.031	41.023	78.3	64.9	21.7	35.1
Core Group	16.089	19.551	82.2	66.3	17.8	33.7
Small Economies	0.537	1.252	24.8	6.9	75.2	93.1
Social Unrest	12.768	19.540	79.2	69.4	20.8	30.6
Outliers	0.638	0.682	7.0	2.5	93.0	97.5
South Africa	13.801	10.459	95.8	43.7	4.2	56.3
<b>WEST AND CENTRAL AFRICA</b>	28.353	41.439	66.2	69.5	33.8	30.5
Core Group	14.658	19.081	64.7	77.2	35.3	22.8
CFA	10.328	17.477	67.1	62.8	32.9	37.2
Small Economies	0.130	0.375	71.9	45.7	28.1	54.3
Social Unrest	3.238	4.506	69.7	65.3	30.3	34.7
<b>NORTH AFRICA</b>	33.075	46.482	49.7	50.3	50.3	49.7

Note:

Calculated from Gundmonds and Webb (1993).

TABLE 10

CEREAL IMPORTS BY SUB-SAHARAN AFRICA, 1970-93  
(IN US\$ MILLION)

Year	Cereals	Wheat	Rice
1970	350	144	97
1971	404	156	103
1972	409	170	100
1973	680	265	232
1974	1143	390	415
1975	1032	446	230
1976	1031	471	244
1977	1421	487	548
1978	1764	575	722
1979	1944	699	751
1980	2686	929	935
1981	2930	972	1151
1982	2660	879	1020
1983	2455	985	855
1984	2458	944	763
1985	2608	1129	690
1986	2057	843	676
1987	1845	632	685
1988	2100	855	686
1989	2200	768	870
1990	2334	962	783
1991	2402	893	918
1992	3179	1024	956
1993	2592	895	875

Source:

FAO (1994), FAO STAT TS 1994.

Affan 1986:114; Reardon 1993:30; World Bank 1989:89 and Kennedy and Reardon 1994:46).

The substitution trend of domestic coarse grains by non-traditional grains has serious short and long-term implications on food security in Africa. First, the substitution is occurring most rapidly in countries where rice and wheat production are either costly, infeasible or both. The preceding analysis indicates that the rising demand for these products are met by commercial imports and/or food aid. However, under the prevailing state of the art, the two instruments are counter to the long-term solution of food insecurity in Africa.<sup>22</sup> Second, the substitution of domestic traditional grains by imported grains is occurring in some of the poorest countries of the world, countries with low and declining per capita incomes coupled with severe foreign exchange constraints. These countries simply cannot afford the rising food imports.

Despite secular decline in per capita food production and the consequent food insecurity in Africa, several policy options are available to close the widening food gap. Improved policy environment, promotion of famine crops in the short to medium-term, removing barriers to facilitate intra-regional trade, expanding agricultural research to generate sustainable and yield-enhancing technologies and improving natural resource management in the medium to long-run will enable the continent to realize and exploit sufficient land and water resources to feed its population.

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<sup>22</sup> Recent empirical evidence from SSA suggests that non-crisis food aid promotes dependence, undermines rural economies and keeps farmers trapped in poverty. Empirical evidence also shows that it is cheaper and more effective for local farmers to grow food for their consumers and at times exporting it to the neighbouring countries than importing the same or a close substitute of domestic commodities (Salih 1994a:17 and World Bank 1995:2).



## IV FOOD POLICIES AND FUTURE OPTIONS

The recent wave of structural adjustment and stabilization programmes throughout Africa has been associated with the removal of controls on consumer prices of staple foods (Salih 1994b:11 and World Bank 1994a:7).<sup>23</sup> There is voluminous literature on food pricing policies in Africa (for example, Mellor 1978; Timmer 1986 and 1994; Salih and Affan 1986; Hay and Rukuni 1988; Krueger *et al.* 1988; Lele 1990; Oyejide 1990; Rukuni *et al.* 1990; Jiriengura 1991; Rubey 1992; Jayne and Rubey 1993; Salih 1993 and 1994; Valdés and Muir-Leresche 1993; Ali 1993 and 1994 and World Bank 1995). Frequently cited policies include domestically produced food staples at low procurement prices in order to keep domestic food prices artificially low so as to benefit urban consumers. Although policy implications are at variance, strong empirical evidence from the majority of these countries suggest that these policies have failed to achieve their designated goals and in some instances they destabilize food production. Hence the resumption of across the board food price controls in these countries becomes less viable under economic reforms. In addition, emerging empirical evidence suggests that remunerative producer prices encourage food production in Africa (Hussain and Faruqee 1994:9 and Salih 1994a:16). However, correcting pricing policies alone will not lead to sustained improvement of food security. Indeed, empirical country studies have shown that the proportion of the population affected by this economic hardship (as consumers) has increased at least in the short-run (Lele 1990:1210; Oyejide 1990:48 and Ali 1994:117).<sup>24</sup>

Remedial actions were taken in several countries to protect the entitlement of vulnerable groups through direct cash support as experienced by Botswana, Cape Verde and recently Sudan (Hay and Rukuni 1988:1018; Osmani 1988:74; Drèze and Sen 1989:135 and Ali 1994:107). Food aid resources have also been transferred into commodity wage; in particular, in countries where food aid represents a substantial portion of international resource flow such as employment projects in Burkina Faso, Ethiopia, Niger, Malawi, Mozambique and Zambia (Braun 1994:52 and Salih 1994a:16). However, these programmes are of a short-term nature and it is not clear whether food aid will ensure adequate availability of food during a long series of droughts in Africa (Table 5).<sup>25</sup>

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<sup>23</sup> At present, nearly 40 African countries have embarked on economic reform programmes supported by the IMF and the World Bank (Salih 1994b:16 and World Bank 1994a:xvii).

<sup>24</sup> On the opposite side, analysis of five to seven African countries indicates that structural adjustment has caused no unequivocal pattern of increase or decline in the real welfare of the rural poor (Sahn and Sarris 1991; Jayne and Ruby 1993 and Hussain and Faruqee 1994).

<sup>25</sup> In fact, the level of cereal food aid provided in 1993/94 to developing countries was the lowest observed since the mid-1970s. Most of the decline is expected to occur in Africa, where food aid is projected to fall from 6.7 million tons recorded in 1992/93 to 3.5 million tons. By contrast, shipment of food aid to Russia and Eastern European countries in 1993/94 are estimated to exceed 4.7 million tons, compared with 4.4 million tons shipped in 1992/93 (FAO 1994:18).

Drought tolerant crops produced and consumed locally (such as cassava and millet) would have a much greater short to medium-run beneficial impact on food security than non-traditional grains; particularly during the hungry season. Cassava, millet and sorghum cover about 100 million hectares in nearly 40 countries across Africa and are mostly used in subsistence farming because traditional grains require few production skills or inputs, are complementary to cash crops and produce reasonable yields under adverse conditions (Salih and Affan 1986:122; Weber *et al.* 1988:1047 and Prudencio and Al-Hassan 1994:57).

Per capita cassava production increased at an annual average rate of 0.8 per cent in Africa between the late 1970s and the early 1990s, while cereal production had a negative per capita growth rate of 0.7 per cent during the same period (Figure 6 and Table A4). Indeed, cassava was the only traditional grain (compared with maize and yams) to grow concomitantly with population growth during the last three decades.<sup>26</sup> More importantly, cassava has had the lowest degree of production instability among all cereals and coarse grains in Africa during the last three decades. The observed variability in cassava production is less than 3 per cent compared with nearly 10 per cent for all cereals and 23 per cent for yams over the past 30 years (Table A4). The variability in cassava production has declined further to less than 2 per cent during the 1980s and the early 1990s. In the short-run, cassava can bridge the temporary food gap during the hungry season. This led to the common belief that cassava is an important famine crop in areas of poor soil fertility and unstable rainfalls such as the semi-arid zones in Africa (Prudencio and Al-Hassan 1994:62). Empirical evidence suggests that cassava has been used to supplement or replace traditional staples (maize, millet, plantain, rice or yams) when stocks of food staples have run down in Central and Eastern Africa during drought and pest-invasion years (Prudencio and Al-Hassan 1994:59).<sup>27</sup> Indeed, increase in demand for cassava coupled with improved marketing facilities will enable rural farmers to protect their food entitlements in the short to medium-run.

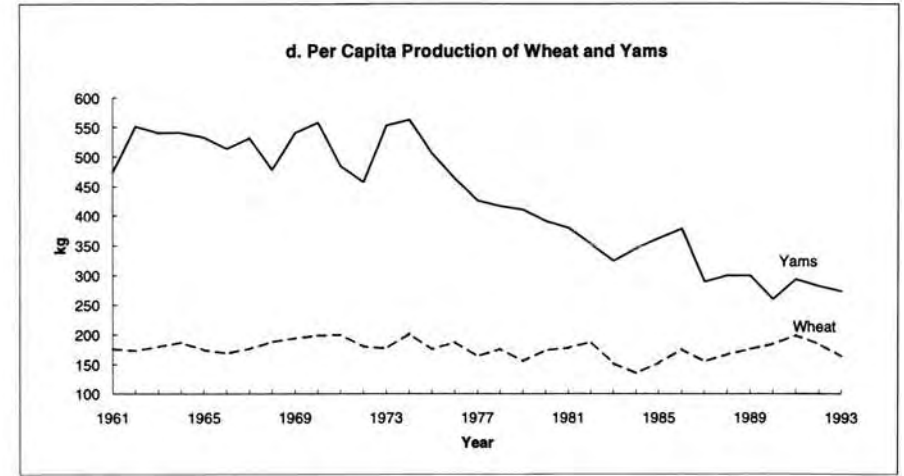
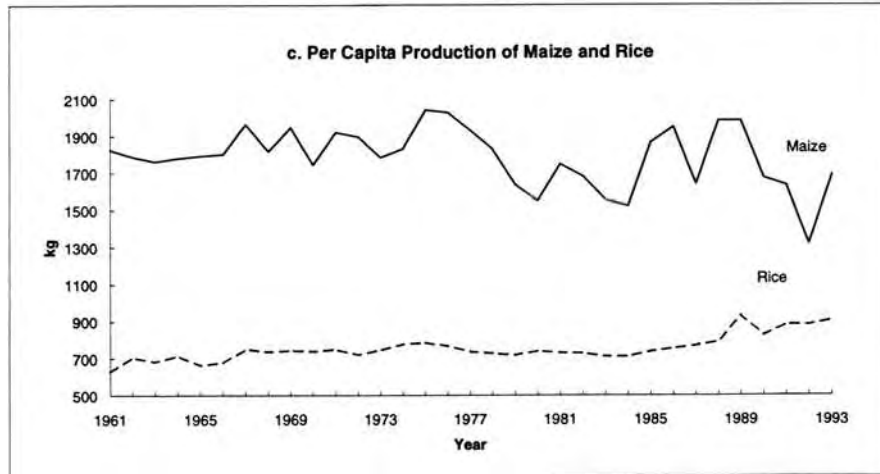
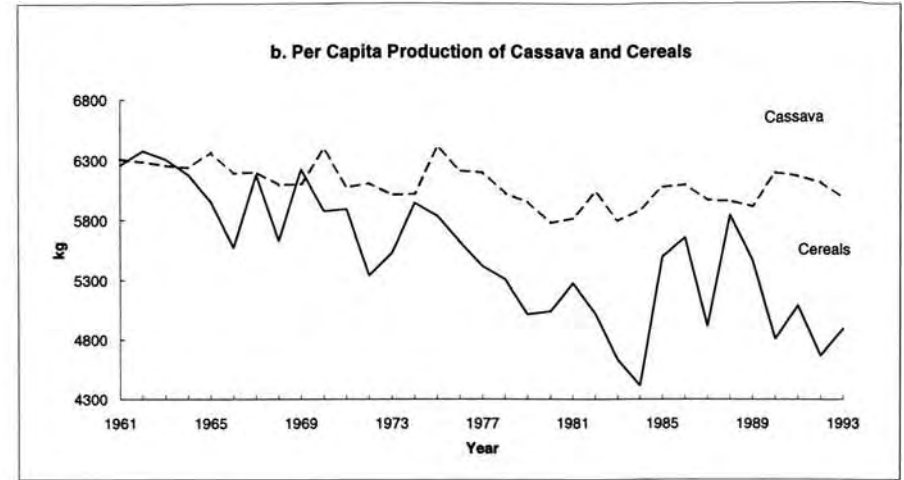
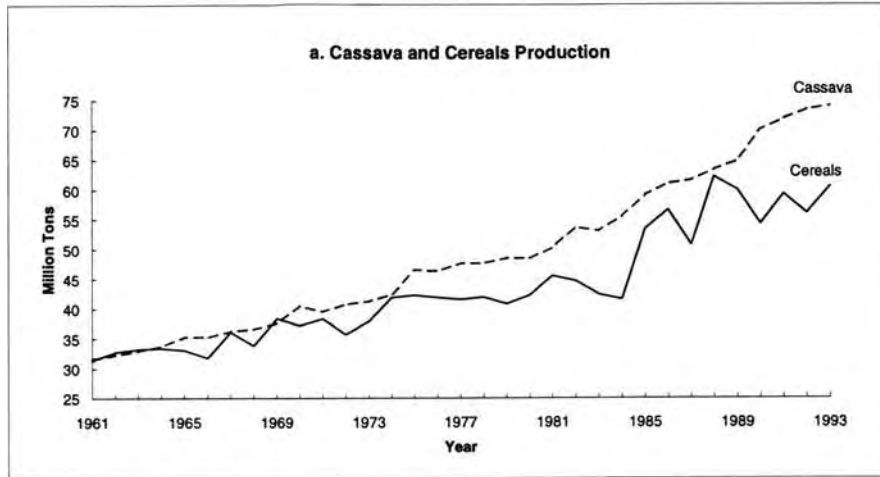
In addition to the role of sorghum and millet as main food staples in the sorghum and millet belt of Africa (extending from the Horn of Africa through the Sudano-Sahelian zone of West Africa), sorghum and millet have been used successfully with wheat flour mixes to produce nutritionally improved wheat-sorghum bread and

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<sup>26</sup> Although per capita wheat production grew at a negative rate between the early 1960s and the early 1990s, per capita growth rate of rice was about 0.8 per cent during the same period and the increase in production comes basically from the sharp rise in Central Africa (Figure 6, Table A4 and Kennedy and Reardon 1994:47).

<sup>27</sup> It is widely accepted that cassava is less sensitive to adverse environmental conditions than most traditional staples and has a low ground storage cost (Neun and Yade 1994:48 and Prudencio and Al-Hassan 1994:58).

FIGURE 6. GRAIN PRODUCTION IN AFRICA, 1961-93



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Source:

Table A4 in the Appendix.

wheat-millet cakes in Sudan and Senegal, respectively (Salih and Affan 1986:119).<sup>28</sup> Technological improvements in production of important food staples could be enhanced further to reduce the imports of non-traditional grains in the medium-run; in particular in countries facing foreign exchange difficulties. Increased regional and international cooperation in food research as a way to close the widening food gap is hardly overemphasized in this study. At present, the amount of arable land and other sources are growing more scarce in Africa. This leaves research and adapted technology as the only option needed to coax greater yields from existing croplands and improved plant stocks. This option is more attractive in the medium to long-term since more time is required to experiment and co-ordinate such activities. Several research and network institutions are engaged in adaptive technological improvements in food and agricultural research throughout the continent such as the Consultative Group on International Agricultural Research (CGIAR) of the World Bank, FAO and UNDP global effort to promote sustainable food security, ECA, IGADD, Institute of Natural Resources in Africa (INRA) of the United Nations University (UNU), National Long Term Perspective Studies (NLTPS) for African Futures of the UNDP, UNSO, 2020 Vision of the International Food Policy Research Institute (IFPRI) and several national agricultural and food research centres. Advances in successful agricultural research in Africa are underestimated in the literature. Primary commodity research was responsible for many innovations in several countries in Africa. For example, short stem maturing sorghum in the sorghum belt, hybrid maize in Zimbabwe and Kenya, improved cotton varieties in Nigeria, Sudan and Uganda, improved soybean in Zimbabwe, several improved wheat varieties in Sudan, Zimbabwe and several more national agricultural research systems have made many encouraging creative contributions (Salih 1993:167 and Virji and Schram 1994:23).

If various research activities are viewed as a joint product, an urgent need presents itself for one or a few institutions such as CGIAR, IFPRI or INRA to take the lead in gathering, coordinating and disseminating information and research findings with a view of intensifying research in staple food among these institutions. Indeed, countries of South-East Asia developed successful rice (staple food) intensification programmes to ensure domestic food security by stabilizing rice prices in their domestic markets in the short-run, doing research and development to raise the productivity of farmers to sustain food security in the medium to long-run, improving the intra and extra-trade environment in the medium to long-term and simultaneously increasing investments to improve domestic marketing systems, especially in rural areas (Timmer 1994:13-15). Although the rice economy of Asia is different from the staple food system of Africa, there is a lot to be learned in recognizing the essential role of agricultural development and the stabilization of the cassava, maize, millet and sorghum economy for rapid and sustainable economic growth. The fundamental lesson from Asia's economic success is that there is no substitute for agricultural development in societies dominated by a rural sector (World Bank 1989:89; Salih 1994b:vi and Timmer

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<sup>28</sup> The adoption of composite flour for bread and cake preparation would mean that the same amount of baked bread and cake could be produced with less wheat requirements and more sorghum or millet, depending on the varying parts of the composite flour starting at 90 per cent wheat and 10 per cent sorghum or millet to 70/30 and the composite mix has been extended at local food research institutes and laboratories in these countries (Salih and Affan 1986:121-122).

1994:19). Hence, investing in rural infrastructure to improve the efficiency of the domestic marketing systems will connect farmers with local buying agents; thus transmitting market information and facilitating exchange. In turn, farmers gain access, acquire inputs and generate income and benefits from trade within a country and between neighbouring countries as experienced in many African countries.

Although evidence suggests that growth of intra-African trade is impeded by long-term constraints (inadequate transport and communication network, poor marketing channels, non-complementary production profiles, etc.), trade reacts fast and may partially eliminate the non-complementary production profiles of African economies (Hay and Rukuni 1988:1021 and Salih 1994b:54). Trade potential is also associated with unrecorded trade activities by the growing informal sector in almost all African countries. This potential is estimated to range between US\$ 3 billion to more than the recorded intra-Africa official trade (Dongala 1993:169 and Salih 1994b:56). Indeed, African economies are more open to trade than currently known, particularly after the implementation of economic reforms by almost 40 countries (Salih 1994b:63). With an expected high trade gain from intra-regional integration, all sub-groups of African states have been encouraged to eliminate trade barriers and obstacles to facilitate goods and factor mobility between them.<sup>29</sup> If trade barriers were to be completely removed in only the main food staples, trade would be welfare-raising for Africa. That is, trade creation for exporters was estimated at US\$ 9 million and trade diversion at US\$ 3.4, in real 1985 prices, with complete removal of barriers in PTA (Yeboah 1993:94). For ECOWAS, trade creation and trade diversion were not significantly different, US\$ 0.9 million and US\$ 0.7 million in constant 1985 prices, respectively (Yeboah 1993:94). The small gain from food trade liberalization within ECOWAS may reflect the existence of long-term trade barriers (Salih 1994b:64). In addition, main food staples (in particular, bananas, rice, maize, plantains, sorghum and wheat) have a higher intra-regional share in total exports than any other food (Salih 1994b:71). This indicates, *inter alia*, that intra-regional trade is an important instrument to realize trade gains, transmit information and transfer technology within the continent. The net gains for Africa could be substantial in the future and would lead African countries to develop new improved food products.

If member countries within each regional sub-group were to orient their production patterns towards products in which they have comparative advantage, then intra-regional trade would be mutually advantageous. Such a strategy could be realized by establishing an active and integrated regional cereal market as suggested in SADCC Food Security Programme (Hay and Rukuni 1988:1021).<sup>30</sup>

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<sup>29</sup> A more pragmatic approach to further and closer intra-African trade links should be based on existing sub-regional organizations, in particular the Economic Community of West African States (ECOWAS), the Economic Community of Central African States (ECCAS), the Maghreb Union of North African States, the Preferential Trade Area (PTA) of Eastern and Southern Africa and the South African Development Coordination Conference (SADCC). The most ambitious and forward-looking economic integration initiative was proposed by the Lagos Plan of Action in 1980, leading to the establishment of a Common Market and eventually the African Economic Community (OAU 1991).

<sup>30</sup> The impacts of seasonal and climatic variations on cereals could be minimized, since member states are located geographically both north and south of the Equator. The recent movement of food aid from

Both PTA and ECOWAS treaties call for cooperation in agricultural development research, extension and the exchange of technical information and experience. Such activities are needed to sustain growth in farm productivity. However, regional cooperation in applying research results, developing natural resources across boundaries (rivers, lakes, land and valleys) and promoting infrastructural projects may require institutional buildings and financing. Experience within SADCC Food Security Programme indicates that such activities require a longer time than anticipated.

The indirect influence of technological transformation on agricultural productivity cannot be ignored. These long-run opportunities merit further research of advantages and costs of alternative diversification strategies in the continent. In so far as the crisis of food production in the region relates to climatic uncertainties and to environmental deterioration, there is a need to consider other avenues of productive expansion. A recent FAO report aired by the mass-media in early January 1995, attests to this fact. That is, light rains and continuing dry weather are threatening this year's cereal crop in Southern Africa (from Angola to Zimbabwe). By contrast, plenty rains and few pests helped boost food output by 34 per cent overall. Eritrea, Ethiopia and Kenya have all increased their crop levels. In Sudan, the output of millet and sorghum is estimated at a record five million tons, almost double last year's crop. Even Somalia was making a good recovery, although crop levels are not as high as before the civil strife there (Voice of America, VOA, 12 January 1995 at 10:07 am EST). Given the actual climatic uncertainties, food production will remain vulnerable to fluctuations in the future and, in turn, income and entitlements will be uncertain.

The potential of land to produce is determined by soil and climatic conditions as well as the level of inputs and management applied to land. Africa has an immense physical land reserve exceeding 600 million hectares; with humid Central Africa and semi-arid Southern Africa covering three-quarters of its land reserve and one-tenth in the Sudano-Sahelian zone (Ayoub 1989:49).<sup>31</sup> Much attention has been given to the threat of desertification in the Sudano-Sahelian Africa, where the deserts were once reported to be advancing by 5-6 km (Ornäs and Salih 1989:13; Baxter 1991:9 and Norse 1994:140). However, there has been a major shift in scientific thinking on this topic in recent years, with an emerging consensus for the view that the area affected by desertification has been greatly over-estimated largely because of methodological weaknesses (Norse 1994:140 and the literature cited there). It is now recognized that drylands are more resilient to drought than previously thought. The contribution of drylands and particularly the desert margins to regional food production is small.<sup>32</sup> The most acute problem is the soil nutrient depletion and soil erosion in Africa. Losses of 20 to 50 tons of topsoil per annum are a common phenomenon in the cultivated areas of Africa and all countries are suffering from nutrient mining at varying degrees, with the

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grains from surplus countries (e.g., Sudan) to grain-deficit countries (e.g., Chad, Somalia, South Africa, Zambia and Zimbabwe) is a case in point (Salih 1994a:17).

<sup>31</sup> By contrast, the Mediterranean and arid North Africa have no remaining land reserves.

<sup>32</sup> For example, low rainfall areas accounted for 12 per cent of SSA's cereal production and unreliable rainfall areas contributed only 7 per cent (Norse 1994:140).

most serious problems occurring in semi-arid areas where livestock manures are in short supply and the use of mineral fertilizers is uneconomic (Ayoub 1989:51 and Norse 1994:139).<sup>33</sup>

Since independence, only a few countries have given soil conservation the priority it deserves. Although soil erosion control does not cause immediate threat to African farmers, its accumulated effect and conservation create a long-term serious food security problem. There is wide recognition that in the long-term, nutrient inputs must balance removals if food production is to be sustained (Norse 1994:139).<sup>34</sup> Effective soil management requires awareness and commitment by farmers, governments and the public at large on conservation measures. Soil degradation can be halted by simple, less costly, effective and affordable techniques. Well-established techniques include terracing steep slopes, contour ploughing, closely planted hedgerows, mulching, alley-cropping or planting food crops between hedgerows (Ayoub 1989:52).<sup>35</sup> Although these techniques are implemented by farmers, governments have a vital role to play. Governments are well-suited to assess the long-term costs of soil erosion including non-farm costs. Such an assessment is needed to guide policymaking, educating the public about the magnitudes and range of solutions to the problem and to develop national soil policies. Water erosion poses similar risks in many countries such as Central Africa, Ghana, Guinea, Liberia, Nigeria, Sierra Leone and Zaire (Ayoub 1989:51).<sup>36</sup> Similar threats are posed by wind erosion in Chad, Mauritania, Niger, Senegal, Somalia and Sudan. Several institutions such as UNDP/African Futures, UNEP and international donor communities can support such efforts by strengthening research and information on land productivity gains and adaptive technology to sustain increases in domestic food production. An emphasis in priority toward domestic production of food crops is likely to improve food security as well as stimulating economic growth.<sup>37</sup>

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<sup>33</sup> More than a quarter of the land in Africa (742 million hectares) is becoming less cultivable. Virtually no inhabited area is unaffected, and many areas face potential soil loss of more than 50 tons/ha/year. For example, losses in Ethiopia alone range from 1-3 billion tons of fertile soil every year. This soil loss is equivalent to 1.5 million tons of grains a year; that is, equal to all relief food shipped to Ethiopia during the famine season of the mid-1980s (Ayoub 1994:51).

<sup>34</sup> The impact on food security arises in several ways. First, through lowering subsistence production. Second, through lowering yields (raising the cost of production) and leading to lower farm incomes and food purchasing power. Third, as a result of soil organic matter reduction and increasing susceptibility to drought (Norse 1994:139).

<sup>35</sup> Intercropping can also help curb erosion by increasing the amount of soil cover.

<sup>36</sup> Intensification of irrigation in North Africa also raised the degree of water re-use and hence intensified the build-up of salt concentrations in both water and soil risks to crop yields and to unsustainability of irrigation. Despite the tolerance of cereals (wheat and rice) to low salinity, yield losses of 10 per cent were reported in North Africa at high salinity levels (Norse 1994:141).

<sup>37</sup> Growing empirical evidence suggests that food crops and cash crops are complementary in production. For example, cotton and cereals in Mali and Sudan; coffee, tea and beans (a major staple) in Rwanda (Weber *et al.* 1988:1047 and Salih 1993:170).

## V CONCLUSIONS

In May 1980 the first economic summit of the Organization for African Unity (OAU) recognized the severity of food insecurity in the continent and placed increased food self-sufficiency on its agenda. The concept of food self-sufficiency has also been emphasized in the Lagos Plan of Action and the year 2000 was set as a target date to achieve self-sufficiency.<sup>38</sup> The fulfilment of this objective will require more than organizing political campaigns. A whole range of policies are identified and sequenced to translate the expressed political commitment needed to enhance food security in the continent.<sup>39</sup>

Causes of food insecurity in Africa have been associated with low per capita food availability and high fluctuations in food supply. Africa was the only region in the world where food production has had a negative per capita growth rate since the early 1960s. About three-quarters of all SSA countries continued to record stagnating or falling levels of per caput food production and the problems of supply instability have compounded the gravity of food insecurity.<sup>40</sup> By contrast, food output per head has increased steadily in the developing countries as a whole and in particular in Latin America and Asia over the past three decades. Empirical evidence also shows a high correlation between food and agricultural production in Africa, like no other region in the world, during the period 1961-93. Food output is not only a major source of food supply, it is also a source of income and livelihood of the majority of the African population. Indeed, it is the secular decline in food production per person (and the consequent decline in per caput agricultural production) that explains most of the persistent decline in per capita incomes in Africa. Hence, lending insights to the conceptual relevance of the entitlement approach to food security in Africa. That is, food security in Africa is not simply about the availability of food production, it is a wider scope of food purchasing power, and therefore concerns the potential impacts of the main determinants of the incomes of African farmers. Nevertheless, food production as a major source of income is highly over-emphasized in this approach.

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<sup>38</sup> The argument for self-sufficiency to fulfil food security is derived from the observed fact that many African countries which become increasingly dependent on food imports from abroad have also developed problems of food inadequacy and hunger within their economies as witnessed in the last decade (Salih 1994a:15 and Timmer 1994:19). There are opposing arguments to this view stemming from the success of some countries (e.g., Botswana, Cape Verde and to a lesser extent Kenya) in enhancing food security in spite of poor records in terms of food self-sufficiency (Drèze and Sen 1989:133-146).

<sup>39</sup> A recent meeting of the Heads of States at the PTA Summit held in Kampala in November 1993 adopted strong measures to improve food security and to speed free mobility of goods and factors between member states (Salih 1994b:64).

<sup>40</sup> Observed variability in both cereals and food production were the highest among the major regions of the world during the last three decades. More serious is the significant increase of production instability through time.



The declining food production per head has forced Africa to increase food imports (both commercial imports and food aid). Trade data demonstrate that food aid may not be stable in the short-run. Even worse, such reliance on food aid and subsidized food imports (mainly grains from North America and Western Europe) are not sustainable in the long-run. Empirical evidence suggests that Africa had to substantially increase its exports of primary commodities to earn the foreign exchange required to finance the rising food imports. However, the prices of primary commodities (coffee, cocoa, cotton, timber, hides and skins and minerals) in world markets are more unstable than the main staple food such as cassava, maize, meat, millet, sorghum and yams (Table A5). In turn, foreign exchange earnings become highly unstable, thus destabilizing the entire macroeconomy. The latter undermined the fundamentals of the SAPs and their impacts on economic growth in Africa. It is, therefore, harder to stabilize export earnings of the small economies of Africa (as price-takers) than to stabilize their non-tradable food production (or entitlements). Emphasis on domestic agriculture as the basic mechanism for providing food security does not necessarily undermine export crop production for two reasons. First, export crops include food crops in several African countries. Second, there is empirical evidence supporting the complementarity (as opposed to competitiveness) of food and cash crops in the majority of these countries.

The above considerations emphasize the importance of food security as a rationale for investing in agriculture and, in turn, in rapid economic growth. There are many lessons to be learned from Asia's economic success in achieving food security. The task of learning the appropriate incentives required to bring about improved and sustainable food security remains an African challenge. Many African countries are trying hard to improve their food security. At the prevailing state of the art, these countries are faced by budgetary and institutional constraints. Typically, these countries rely heavily on a narrow set of inherited colonial policy instruments. These policies were designed to integrate colonies into metropolitan trading networks and to protect the settler population. Virtually the same today with 'foreign commercial interest', replacing the 'settler population'.

Colonial policy in Africa was shaped by two forces: the labour requirements of mining and the presence of the large settler population (USDA 1979:124 and Salih 1994a:13). The labour reserve was required to provide low value-added activities for both mining and white-owned farming. Consequently, the need to feed the miners created a demand for food commodities. At the initial stage, African producers were the main suppliers of indigenous food-stuffs. At a subsequent stage, the introduction of a dual land-tenure system and increased government intervention policies improved the position and hence the commercial procurement from larger white-owned farms.

Trade patterns shaped by colonialism have not been fundamentally changed and exports of primary commodities are still the order of the day. As a result, no technological improvements nor wide range marketing activities have been introduced to enable countries to diversify their exports. The range of government food policies have been limited and their instruments were designed to provide much of the tax

revenue and sources of foreign exchange. These policies were of a short-term nature and some variants of these policies are still in force.

On the one hand, government policies failed to attract long-term investment in the food sector. On the other hand, the continuous decline in government investment coupled with its crowding-in effect of private investment have weakened the infrastructural support needed to promote marketing of locally produced food. That is, the non-price factors have been shown to be extremely important in improving food sector growth as translated in the low priority given to food production in Africa in the last two decades (Chhibber 1988:44; Lele and Mellor 1988:29; Taylor 1988:152; Binswanger 1989:27; Knudsen and Nash 1991:138; Chhibber and Fischer 1991:3 and Salih 1994a:15).

The failure of African countries to restructure incentives in favour of food production comes at a high cost in terms of reliance on costly and unstable imported food. A switch in priority away from non-traditional food imports towards domestically-produced staple food is likely to improve food security in the short to medium-term. Agricultural development policies should give more attention and widespread confidence to furthering innovative agricultural research in improved varieties of cassava, hybrid maize, millet, sorghum and wheat. Such advances in agricultural research have achieved significant productivity growth and must be supported by improved extension services, promotion of intra-African trade and strengthening market-facilitating institutions. Rapid economic growth in the successful developing countries of Asia has been achieved by, *inter alia*, improved efficiency and competitiveness. Successful competitors were stimulated by both successful agricultural development and learning by doing. Intra-African trade provides an opportunity for African countries to experience learning by doing in order to catch up in the future with the successful competitors. Indeed, the main staple foods (bananas, maize, plantains, rice and sorghum) have the highest regional share in total exports than the remaining traded commodity-groups within the major sub-regions. If the unreported flourishing border trade between neighbouring countries (which is estimated to exceed the officially recorded trade) is taken into consideration, intra-regional trade will be larger than currently known.

If African countries were to reorient their production patterns towards products in which they have comparative advantages, then intra-regional trade will be mutually advantageous. Such a strategy could be realized by establishing active and integrated regional cereal markets as suggested in several sub-regional groups. In fact, several African countries are actively seeking multi-year trading contracts in food and agricultural products with food-surplus countries within the same regional sub-group. This demonstrates that trade is fast-reacting and benefit may well be derived from marketing to improve infrastructure, communication, technological deepening and managerial skills in the medium to long-run.

Without these stimuli, it is difficult to see how stability of food supply and genuine food security can be achieved in Africa. Successful agricultural policies should also remove constraints on the main factors of production, such as the quality of land, to

sustain growth in total factor productivity. The major future problem is the rate of soil nutrient depletion and soil erosion in all African countries. Effective soil management techniques are well-known and are based on indigenous knowledge. If these simple and affordable techniques were to be applied successfully by farmers to halt soil degradation, then the government's supportive role is to educate the public about the soil conservation strategy and its long-term impacts on food security. The competence of governments and their ability to learn from past mistakes are necessary ingredients in solving domestic food problems. Much of the explanation of the success of food security programmes in Asia can be traced directly to both the appropriate role of the Asian government and their learning process from their agricultural sector.

It is not clear whether the short-sighted view of crisis-management and survival strategy will also guide design of food security strategy in African countries in the future. The failure of these governments to view the continuing food problems in Africa as a long-term security issue comes at a high cost in terms of continuing loss of the quality of human capital. The latter is a long-term constraint and is in short supply in the continent. The opportunity of pursuing the conventional short-term food policies outweighs the cost of change in favour of long-term strategy. Of course, there are a good number of alternatives which have not been considered here such as buffer stock systems, grain insurance programme, industrialization and diversification.

Theoretically, buffer stock from domestic production gives a country (or a region) a more secure basis for managing crises as demonstrated in large countries such as India (Osmani 1993:78). However, grain storage is costly to implement in small African countries.<sup>41</sup>

The need for diversification has often been adequately stressed in outlining possible solutions to the food insecurity problem in Africa. The historical experience of many countries in the region tends to be severely underestimated in the literature such as diversification within the agricultural sector (for example, between food crops and cash crops, or between crops and livestock), combination of agricultural and non-agricultural activities (for example, crafts and trade) within the rural sector, and the use of extensive links between different rural regions and between rural and urban areas; through wage employment and remittances (Salih 1994a:18).

The promise of future industrialization as a development strategy for Africa is beyond the scope of this study. However, the fundamental lesson to be learned from newly industrialized countries is that they succeeded in their manufacturing export-led strategy by using international markets as an outlet for exports, especially manufactured goods. Simultaneously, at the early stages of industrialization the local market was reserved for domestic firms to learn how to manufacture high-quality products (Timmer

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<sup>41</sup> Optimal buffer stock is defined according to a storage rule in which the expected gain from adding an amount of reserves equals the expected cost of holding that amount of stock until it would be withdrawn. The underlying assumption is that the change in price for the stored commodity from the time the food item is added to the reserve to when it is removed from the reserve equals the cost of holding the stock for the period of time. That is, the amount of storage is based on the expectation that investment in holding reserves would yield a normal rate of return on that investment (Johnson 1981:260).

1994:13). The process for industrialization and the learning process to compete in export-led manufacturing industries will likely take longer than improving domestic agriculture in the rural-dominated society of Africa. Nevertheless, alternative strategies that will enable the beneficiaries to improve their sources of income and entitlements are worth exploring if they will lead Africans in their quest for food security.

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## **APPENDIX**

Tables A1-A5

TABLE A1. INDICES OF PRODUCTION PER CAPUT, 1975-93  
(IN PER CENT, BASE YEAR 1979-81 = 100)

Year	Africa			Latin America			Asia			Developing Countries			World		
	Agriculture	Food	Cereals	Agriculture	Food	Cereals	Agriculture	Food	Cereals	Agriculture	Food	Cereals	Agriculture	Food	Cereals
1961	113.6	114.1	73.0	88.0	95.1	51.3	79.5	79.6	49.5	84.5	86.2	51.1	87.5	88.9	55.7
1962	114.1	114.9	76.3	88.7	96.0	52.3	82.0	82.0	52.4	86.8	88.5	54.4	89.0	90.5	59.3
1963	115.0	116.0	77.4	89.9	95.3	57.5	83.9	84.4	56.2	88.6	90.2	58.3	89.8	91.3	60.3
1964	115.4	117.4	77.9	89.9	93.5	64.7	86.6	87.2	59.5	90.3	91.8	61.5	91.3	92.8	63.6
1965	113.3	114.9	77.0	90.7	97.2	62.4	86.2	87.1	58.8	90.1	92.3	60.7	90.4	92.2	63.4
1966	111.9	114.4	74.0	90.9	94.2	64.3	87.1	88.3	61.7	90.4	92.1	62.8	92.7	93.8	68.5
1967	115.4	116.6	84.2	93.5	96.8	69.5	87.8	89.1	65.1	91.8	93.5	67.1	94.5	95.5	71.3
1968	112.8	114.5	78.8	92.0	94.4	67.4	88.2	89.2	67.1	91.8	93.2	68.7	95.1	96.0	73.7
1969	116.4	119.0	89.5	93.1	95.4	70.0	87.9	88.7	68.7	92.0	93.3	70.5	93.3	94.2	74.3
1970	118.4	120.5	86.8	94.9	95.4	77.3	90.9	91.3	74.2	94.6	95.2	75.7	94.6	95.3	75.7
1971	115.4	117.2	89.4	91.8	94.1	78.5	91.3	91.8	76.1	94.1	95.1	77.7	95.8	96.5	82.5
1972	109.4	111.8	83.2	91.3	93.3	73.6	88.5	89.2	74.2	91.4	92.6	75.3	93.0	93.9	79.9
1973	108.0	110.5	88.5	91.1	91.9	81.1	91.7	92.4	79.5	93.3	94.3	80.4	96.5	97.0	86.2
1974	111.9	113.5	97.7	93.4	95.7	84.9	90.3	91.2	80.0	93.3	94.6	82.0	96.0	96.6	84.2
1975	108.9	108.0	112.4	95.9	95.3	99.4	94.8	94.8	96.4	96.0	96.3	88.1	97.3	97.2	93.9
1976	105.3	105.1	108.2	96.5	99.5	108.6	94.1	94.1	94.9	96.3	95.8	89.7	98.0	98.2	98.8
1977	102.2	101.6	99.1	99.7	100.0	102.5	95.3	95.2	95.6	96.4	96.6	90.0	98.5	98.3	97.0
1978	101.9	101.8	102.7	98.3	98.2	96.5	99.3	99.2	100.8	99.1	99.2	96.3	101.2	101.3	103.9
1979	99.7	99.6	95.6	98.8	98.6	97.4	98.6	98.7	98.8	98.7	98.7	96.5	100.1	100.1	98.9
1980	100.5	100.4	100.9	98.7	99.8	95.6	99.3	99.4	99.4	99.6	99.3	99.1	99.0	99.2	98.8
1981	99.8	100.0	103.5	102.4	101.6	107.0	102.1	101.9	101.8	101.7	102.0	104.4	100.9	100.7	102.3
1982	97.7	97.6	95.8	101.0	102.8	116.2	104.6	103.9	103.0	103.0	103.2	107.3	102.2	102.2	104.4
1983	93.0	93.0	82.2	98.1	98.5	100.7	108.0	107.8	110.9	104.7	104.7	114.9	100.1	100.2	99.9
1984	91.1	91.1	80.2	98.7	99.5	107.6	111.7	110.5	112.5	106.3	106.9	118.6	103.9	103.7	107.2
1985	96.0	96.1	99.8	103.4	103.2	104.4	111.9	111.0	108.8	107.8	108.4	119.2	104.6	104.3	107.2
1986	97.3	97.7	102.4	97.6	99.4	103.9	112.3	112.6	109.1	108.6	108.0	121.8	103.8	104.3	106.3
1987	94.1	94.6	91.7	101.5	102.1	107.9	112.3	111.9	105.3	107.9	108.0	120.2	102.9	102.9	100.9
1988	96.9	97.7	102.0	104.2	105.9	106.4	115.9	115.5	108.5	111.2	111.2	126.5	103.0	102.9	97.8
1989	97.2	97.9	104.2	104.4	106.5	102.2	117.3	117.0	110.9	112.2	111.9	129.9	104.8	105.1	104.0
1990	95.4	96.2	93.4	103.4	105.2	84.9	120.8	120.8	113.5	114.6	114.0	133.7	105.7	105.9	106.4
1991	96.9	98.0	102.6	104.0	105.7	90.6	121.9	121.2	110.1	115.5	115.3	134.5	104.5	104.4	100.9
1992	92.0	93.1	85.2	105.5	107.9	101.4	124.0	123.8	111.1	117.0	116.2	138.3	105.8	106.2	104.1
1993	92.2	93.4	92.6	102.3	105.8	97.6	124.2	124.5	110.6	117.4	115.9	140.1	102.8	103.3	99.3

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TABLE A2. INDEX OF FOOD PRODUCTION PER CAPUT, 1961-93  
(IN PER CENT, BASE YEAR 1979-81 = 100)

	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
<b>EAST AND SOUTHERN AFRICA</b>	<b>104.5</b>	<b>106.4</b>	<b>79.1</b>	<b>79.4</b>	<b>77.9</b>	<b>78.9</b>	<b>81.9</b>	<b>79.4</b>	<b>82.1</b>	<b>82.4</b>	<b>82.6</b>	<b>81.6</b>	<b>80.5</b>	<b>80.8</b>	<b>109.7</b>	<b>111.0</b>	<b>109.1</b>	<b>106.9</b>	<b>99.3</b>	<b>99.0</b>
<b>Core Group</b>	<b>103.0</b>	<b>103.8</b>	<b>103.1</b>	<b>104.2</b>	<b>101.3</b>	<b>104.2</b>	<b>105.7</b>	<b>101.9</b>	<b>108.0</b>	<b>108.1</b>	<b>109.0</b>	<b>110.3</b>	<b>107.8</b>	<b>110.6</b>	<b>110.5</b>	<b>113.3</b>	<b>111.1</b>	<b>109.3</b>	<b>99.9</b>	<b>98.9</b>
Burundi	96.7	94.1	89.8	101.5	98.2	97.8	101.4	100.9	96.4	100.0	103.2	92.7	103.4	96.5	102.9	103.1	102.6	105.6	98.6	96.9
Kenya	97.0	104.5	100.6	99.7	99.1	101.3	99.8	102.0	105.3	103.1	101.5	105.8	107.3	104.4	117.8	117.0	118.3	112.3	107.4	98.3
Lesotho	142.0	138.9	134.8	128.9	124.7	127.4	132.1	126.1	130.1	123.9	132.4	104.3	112.1	143.3	103.3	97.9	120.5	125.3	106.5	97.9
Madagascar	106.9	108.3	108.2	111.1	106.0	109.2	111.9	111.3	112.9	112.4	109.3	109.5	108.3	117.4	112.2	111.8	104.1	100.2	96.6	102.4
Malawi	80.2	84.1	80.3	81.9	84.2	85.1	97.3	88.5	91.5	84.5	98.9	98.9	104.8	100.7	96.9	100.9	105.0	105.5	101.8	98.5
Namibia	113.6	99.2	117.7	115.9	112.0	104.4	115.5	117.9	114.0	118.1	124.7	132.9	135.1	134.9	112.8	113.3	102.0	103.5	101.1	99.2
Tanzania	97.5	97.5	102.7	101.9	101.5	108.3	102.9	96.8	98.9	101.1	95.6	93.6	95.4	93.7	92.7	100.0	98.4	99.2	100.4	100.1
Uganda	131.9	125.6	130.3	126.5	117.9	113.3	121.2	122.1	131.9	153.4	144.0	144.1	138.5	141.6	127.6	125.7	120.2	122.1	95.0	98.6
Zambia	98.3	96.0	92.2	97.0	97.2	102.5	100.9	99.0	99.0	94.6	102.6	113.5	102.4	108.4	126.2	136.7	128.2	116.7	100.4	102.8
Zimbabwe	99.0	99.8	88.3	98.5	88.7	97.5	102.2	79.2	116.6	88.8	113.8	125.8	96.1	120.1	115.8	124.3	119.3	115.9	90.6	91.8
<b>Small Economies</b>	<b>91.2</b>	<b>90.0</b>	<b>93.4</b>	<b>94.7</b>	<b>98.9</b>	<b>103.6</b>	<b>104.1</b>	<b>101.5</b>	<b>102.4</b>	<b>106.9</b>	<b>106.2</b>	<b>106.6</b>	<b>102.4</b>	<b>104.9</b>	<b>94.8</b>	<b>96.2</b>	<b>90.3</b>	<b>100.4</b>	<b>94.7</b>	<b>102.3</b>
Comoros	123.0	123.4	127.5	131.3	141.5	140.6	131.5	130.9	127.8	125.7	124.4	118.7	117.8	116.9	122.6	112.6	106.8	105.2	101.1	106.4
Reunion	136.7	108.1	112.9	97.9	110.8	100.3	98.0	94.5	99.9	73.5	69.1	89.9	95.1	92.3	96.5	104.2	107.8	114.1	110.0	93.5
Swaziland	67.9	65.6	68.4	68.0	67.7	76.6	84.1	80.0	83.9	93.2	92.9	97.8	91.1	96.2	94.6	95.2	88.1	98.7	92.8	103.4
<b>Social Unrest</b>	<b>105.7</b>	<b>109.0</b>	<b>107.0</b>	<b>106.9</b>	<b>105.2</b>	<b>106.5</b>	<b>110.5</b>	<b>107.7</b>	<b>110.6</b>	<b>112.2</b>	<b>110.1</b>	<b>108.2</b>	<b>107.1</b>	<b>104.9</b>	<b>107.6</b>	<b>105.3</b>	<b>104.4</b>	<b>101.5</b>	<b>97.6</b>	<b>99.4</b>
Angola	154.1	160.2	155.3	164.6	167.0	169.7	172.0	166.1	175.4	175.0	176.1	167.9	168.5	168.3	115.4	114.1	107.9	103.1	101.9	101.0
Ethiopia	111.6	112.0	111.7	113.1	107.5	109.5	107.3	108.7	108.2	109.8	105.2	103.2	102.1	94.2	96.8	94.5	90.1	97.6	105.6	98.9
Mozambique	78.1	79.3	81.0	85.5	86.0	87.6	91.4	95.8	96.8	100.4	102.9	106.9	109.0	109.3	118.6	115.2	110.1	104.3	101.6	100.0
Rwanda	79.3	101.0	73.5	70.5	74.5	78.5	91.2	85.8	88.7	93.2	91.6	86.2	88.0	84.1	94.3	96.7	97.7	96.4	99.8	97.9
Somalia	98.1	98.6	100.0	101.1	101.6	104.4	107.4	109.1	108.8	108.5	103.7	109.3	98.9	93.0	116.2	111.1	108.5	107.9	100.2	101.1
Sudan	101.8	106.7	106.2	97.4	98.7	96.7	111.6	96.4	105.9	107.0	107.2	102.5	101.6	110.3	101.5	97.2	101.4	101.0	91.5	98.9
<b>Outliers</b>	<b>127.1</b>	<b>118.2</b>	<b>131.3</b>	<b>121.2</b>	<b>131.4</b>	<b>124.2</b>	<b>134.6</b>	<b>122.3</b>	<b>127.4</b>	<b>118.9</b>	<b>128.9</b>	<b>130.6</b>	<b>121.2</b>	<b>125.4</b>	<b>120.4</b>	<b>140.0</b>	<b>124.5</b>	<b>104.5</b>	<b>111.7</b>	<b>87.9</b>
Botswana	134.8	123.7	132.1	138.5	134.0	138.7	143.8	133.2	135.3	131.9	147.6	139.4	124.2	134.0	129.0	144.7	127.1	101.2	110.7	88.2
Mauritius	118.0	111.7	130.4	100.9	128.3	107.1	123.7	109.6	118.1	103.6	107.0	120.3	117.7	115.4	90.4	123.9	115.3	116.0	115.1	86.9
<b>South Africa</b>	<b>99.4</b>	<b>97.8</b>	<b>100.5</b>	<b>93.8</b>	<b>93.8</b>	<b>94.2</b>	<b>112.9</b>	<b>95.6</b>	<b>99.1</b>	<b>95.2</b>	<b>104.6</b>	<b>108.1</b>	<b>86.9</b>	<b>105.1</b>	<b>96.3</b>	<b>93.1</b>	<b>97.6</b>	<b>100.3</b>	<b>95.5</b>	<b>96.5</b>
<b>WEST AND CENTRAL AFRICA</b>	<b>112.7</b>	<b>113.4</b>	<b>115.5</b>	<b>117.2</b>	<b>117.8</b>	<b>115.1</b>	<b>117.2</b>	<b>116.3</b>	<b>122.0</b>	<b>127.4</b>	<b>118.3</b>	<b>106.7</b>	<b>109.3</b>	<b>113.0</b>	<b>107.2</b>	<b>103.1</b>	<b>99.6</b>	<b>99.1</b>	<b>98.4</b>	<b>101.0</b>
<b>Core Group</b>	<b>116.8</b>	<b>117.7</b>	<b>120.5</b>	<b>122.0</b>	<b>124.0</b>	<b>120.7</b>	<b>123.6</b>	<b>122.5</b>	<b>132.7</b>	<b>143.8</b>	<b>127.1</b>	<b>110.9</b>	<b>116.4</b>	<b>121.1</b>	<b>108.6</b>	<b>103.1</b>	<b>99.6</b>	<b>95.6</b>	<b>96.8</b>	<b>103.4</b>
Gambia	158.5	155.8	155.5	159.3	166.3	171.8	149.2	166.3	154.0	157.3	160.9	139.5	149.9	148.3	153.6	137.0	104.7	130.6	90.5	91.7
Ghana	115.3	112.6	110.7	116.6	111.0	116.5	120.1	117.7	121.5	130.8	128.6	118.5	122.8	132.4	133.4	116.7	105.4	101.1	104.2	100.6
Guinea	104.2	109.5	96.5	102.8	95.0	98.7	104.1	104.2	100.8	100.2	102.5	97.7	102.0	101.3	103.8	104.1	103.1	99.0	95.2	102.6
Mauritania	118.0	111.7	130.4	100.9	128.3	107.1	123.7	109.6	118.1	103.6	107.0	120.3	117.7	115.4	90.5	95.2	95.8	98.8	98.2	99.5
Nigeria	117.3	118.6	122.7	123.9	126.9	122.3	124.9	124.0	136.1	148.5	128.3	110.2	116.0	120.5	106.2	101.4	98.8	94.4	96.1	103.9



	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
<b>CFA</b>	<b>102.8</b>	<b>103.1</b>	<b>106.4</b>	<b>110.0</b>	<b>110.0</b>	<b>107.2</b>	<b>110.0</b>	<b>108.5</b>	<b>110.3</b>	<b>109.4</b>	<b>109.8</b>	<b>99.2</b>	<b>98.7</b>	<b>103.2</b>	<b>104.2</b>	<b>100.4</b>	<b>96.1</b>	<b>103.7</b>	<b>100.1</b>	<b>97.3</b>
Benin	97.0	92.5	91.8	94.2	96.9	95.0	99.5	102.8	100.7	103.2	102.3	102.3	103.1	96.0	92.8	100.2	97.5	106.3	107.5	98.1
Burkina Faso	106.7	113.7	112.7	119.6	122.5	118.3	119.3	121.0	117.8	117.6	111.4	103.0	87.7	94.5	109.9	95.4	97.5	101.2	103.2	94.9
Cameroon	90.2	90.5	97.3	98.1	94.6	95.2	101.0	102.8	102.4	109.6	110.5	112.1	111.9	116.0	116.0	109.9	110.8	102.1	101.3	98.9
Central African Rep.	93.7	94.8	96.5	96.5	97.7	87.7	91.2	93.1	97.9	97.8	98.7	101.8	104.1	104.1	101.7	99.3	101.0	100.4	98.8	100.2
Congo	116.7	115.8	114.2	117.4	116.8	113.7	114.6	111.3	107.0	105.5	105.6	101.8	101.1	100.2	102.4	101.4	99.3	97.8	98.7	100.2
Côte d'Ivoire	79.5	78.0	84.2	93.2	84.9	92.3	80.7	91.6	88.1	90.6	90.9	86.9	89.4	86.3	88.5	84.6	89.2	91.8	97.8	100.8
Gabon	107.6	108.8	109.2	110.4	113.0	114.6	116.2	120.5	117.3	117.5	118.8	115.6	113.4	108.6	95.4	95.4	92.1	96.8	99.2	102.3
Mali	91.2	93.5	93.3	92.8	95.7	95.2	99.0	96.3	101.6	99.5	97.3	84.1	75.3	82.0	96.6	95.8	93.9	99.9	98.4	97.1
Niger	117.3	118.6	122.7	123.9	126.9	122.3	124.9	124.0	136.1	148.5	128.3	110.2	116.0	120.5	69.8	86.5	95.5	98.6	100.2	101.9
Senegal	150.9	144.0	150.6	157.4	163.1	139.7	166.4	131.4	143.5	105.6	139.8	91.5	106.1	134.6	160.3	139.6	88.0	137.5	95.9	86.0
Togo	117.7	119.8	125.4	126.3	126.4	126.2	119.3	118.4	113.8	118.3	116.4	107.4	106.4	103.3	101.9	95.6	92.2	99.0	102.4	99.5
<b>Small Economies</b>	<b>139.2</b>	<b>142.9</b>	<b>136.7</b>	<b>140.7</b>	<b>135.3</b>	<b>131.6</b>	<b>134.9</b>	<b>125.7</b>	<b>118.2</b>	<b>112.4</b>	<b>97.4</b>	<b>95.0</b>	<b>90.8</b>	<b>92.1</b>	<b>124.4</b>	<b>135.4</b>	<b>93.9</b>	<b>100.8</b>	<b>97.8</b>	<b>93.4</b>
Cape Verde	142.2	152.4	143.9	155.0	151.7	137.9	150.4	111.2	113.0	87.0	51.2	33.2	40.1	45.6	50.8	84.9	91.8	89.0	76.6	104.7
Guinea-Bissau	132.1	133.1	130.8	128.8	124.2	122.5	123.0	125.2	115.4	116.4	106.3	110.5	100.9	102.4	124.4	135.4	93.9	100.8	97.8	93.4
São Tomé & Príncipe	186.9	192.5	162.5	193.3	174.3	186.3	183.4	174.6	157.1	157.3	167.4	158.7	164.1	151.1	119.7	113.5	101.7	108.2	111.9	91.3
<b>Social Unrest</b>	<b>115.5</b>	<b>115.8</b>	<b>114.5</b>	<b>113.7</b>	<b>112.0</b>	<b>111.0</b>	<b>110.2</b>	<b>110.9</b>	<b>110.1</b>	<b>109.9</b>	<b>107.8</b>	<b>106.4</b>	<b>106.0</b>	<b>106.0</b>	<b>107.8</b>	<b>106.4</b>	<b>105.2</b>	<b>101.3</b>	<b>99.9</b>	<b>100.5</b>
Chad	110.5	116.7	121.6	117.7	113.2	115.8	112.4	118.1	114.0	107.7	106.8	100.6	93.3	94.4	98.0	98.3	99.2	103.6	103.5	102.1
Liberia	89.0	90.0	87.5	87.5	91.2	97.8	94.5	96.3	95.3	104.0	105.6	104.1	104.8	105.8	102.9	104.3	105.5	103.1	101.0	98.1
Sierra Leone	93.9	99.1	99.6	104.8	105.6	111.9	110.3	105.5	114.8	107.2	107.3	106.5	106.2	103.8	107.4	106.5	105.5	108.9	99.3	100.7
Zaire	120.4	119.3	117.0	115.9	114.0	111.1	111.0	111.5	110.0	110.9	108.1	107.4	107.9	108.0	109.8	107.8	106.1	100.1	99.2	100.4
<b>NORTH AFRICA</b>	<b>95.8</b>	<b>110.6</b>	<b>110.0</b>	<b>106.9</b>	<b>110.3</b>	<b>98.3</b>	<b>100.6</b>	<b>114.9</b>	<b>107.0</b>	<b>105.9</b>	<b>109.7</b>	<b>110.3</b>	<b>104.2</b>	<b>106.9</b>	<b>108.5</b>	<b>108.3</b>	<b>97.5</b>	<b>101.6</b>	<b>102.1</b>	<b>102.4</b>
Algeria	113.6	131.7	125.1	113.6	119.7	91.0	105.0	122.8	115.2	112.8	114.5	115.2	105.2	107.4	124.2	110.8	93.3	93.2	95.6	107.4
Egypt	93.3	107.0	105.3	105.8	104.8	103.4	98.7	106.3	108.9	106.1	107.9	107.9	106.3	104.4	108.0	107.2	101.2	101.7	102.1	99.2
Libya	66.6	67.3	64.9	59.2	79.2	84.2	78.9	80.7	82.6	73.9	61.4	87.8	86.3	88.5	122.1	127.0	88.3	78.6	108.2	99.4
Morocco	90.9	110.8	113.9	113.8	119.1	98.3	106.5	140.2	109.0	112.3	121.0	118.2	101.3	114.9	96.2	107.4	90.7	108.7	107.8	106.3
Tunisia	88.9	91.9	107.0	99.5	106.9	96.5	93.0	87.6	76.5	81.4	98.6	99.1	106.4	107.8	118.7	110.8	104.8	102.1	94.6	105.9

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1961-79			1980-93		
														Mean	S.D.	C.V.	Mean	S.D.	C.V.
<b>EAST AND SOUTHERN AFRICA</b>	<b>101.7</b>	<b>98.7</b>	<b>96.5</b>	<b>89.3</b>	<b>96.0</b>	<b>95.6</b>	<b>90.5</b>	<b>94.4</b>	<b>91.6</b>	<b>89.4</b>	<b>88.6</b>	<b>81.5</b>	<b>82.1</b>	<b>90.2</b>	<b>12.9</b>	<b>14.3</b>	<b>92.5</b>	<b>5.8</b>	<b>6.3</b>
<b>Core Group</b>	<b>101.1</b>	<b>100.5</b>	<b>98.6</b>	<b>91.2</b>	<b>97.3</b>	<b>98.1</b>	<b>93.7</b>	<b>97.1</b>	<b>96.4</b>	<b>94.1</b>	<b>90.5</b>	<b>82.1</b>	<b>85.5</b>	<b>106.6</b>	<b>3.8</b>	<b>3.5</b>	<b>94.7</b>	<b>5.4</b>	<b>5.7</b>
Burundi	104.5	96.1	94.1	90.8	98.2	101.5	101.9	101.1	92.1	97.4	96.4	96.6	91.8	99.2	4.0	4.1	97.1	4.0	4.1
Kenya	94.3	106.7	108.6	86.2	101.4	110.5	104.6	109.8	109.0	103.2	98.7	93.7	82.9	105.5	6.3	6.0	100.6	8.4	8.4
Lesotho	95.7	82.0	81.2	81.3	83.4	74.7	77.0	93.7	88.4	95.0	70.2	57.5	70.3	123.9	13.0	10.5	82.0	11.2	13.6
Madagascar	101.0	96.7	98.2	96.9	95.2	95.1	92.0	91.4	91.6	90.3	87.2	85.9	85.5	108.8	4.6	4.2	93.5	5.1	5.5
Malawi	99.7	102.5	90.6	89.5	85.5	86.2	80.7	78.7	70.9	65.2	68.7	51.3	70.4	93.2	8.9	9.5	81.3	14.2	17.5
Namibia	99.6	78.0	65.6	66.5	69.6	70.4	74.6	72.0	75.9	71.5	73.0	70.7	72.4	115.2	10.6	9.2	75.6	10.2	13.5
Tanzania	99.5	97.7	96.5	94.6	96.2	94.9	92.0	88.7	91.4	90.7	84.9	78.7	75.5	98.8	3.8	3.8	91.5	7.1	7.8
Uganda	106.4	105.9	112.2	100.4	100.4	97.6	98.3	100.2	105.9	107.1	106.0	103.9	109.1	128.0	12.7	10.0	103.7	4.3	4.2
Zambia	96.8	92.1	92.0	86.2	92.1	92.4	88.5	104.9	103.9	90.5	91.2	77.7	99.1	105.9	12.2	11.6	93.6	7.2	7.7
Zimbabwe	117.6	99.5	73.8	77.6	106.5	100.6	79.0	102.0	92.2	90.6	81.3	41.3	77.6	104.2	13.8	13.2	88.0	17.9	20.3
<b>Small Economies</b>	<b>103.0</b>	<b>100.2</b>	<b>95.6</b>	<b>102.2</b>	<b>99.3</b>	<b>107.7</b>	<b>97.9</b>	<b>97.6</b>	<b>96.3</b>	<b>93.6</b>	<b>95.8</b>	<b>83.3</b>	<b>82.3</b>	<b>99.1</b>	<b>5.6</b>	<b>5.7</b>	<b>96.9</b>	<b>6.8</b>	<b>7.0</b>
Comoros	92.6	94.1	97.2	83.9	85.1	86.9	92.3	90.6	89.0	87.1	98.3	83.6	82.7	122.6	10.7	8.7	90.7	6.5	7.1
Reunion	96.4	97.3	79.8	88.0	82.1	80.5	82.8	94.0	72.2	83.1	93.1	88.8	82.8	100.6	14.4	14.3	86.7	7.2	8.3
Swaziland	103.8	100.6	97.6	103.9	101.4	111.1	99.8	98.1	99.2	94.9	96.1	82.7	82.2	84.4	11.5	13.7	98.2	7.5	7.6
<b>Social Unrest</b>	<b>103.0</b>	<b>94.4</b>	<b>91.7</b>	<b>84.8</b>	<b>93.1</b>	<b>90.0</b>	<b>83.4</b>	<b>88.6</b>	<b>80.7</b>	<b>78.5</b>	<b>84.0</b>	<b>80.0</b>	<b>74.7</b>	<b>106.7</b>	<b>3.3</b>	<b>3.1</b>	<b>87.6</b>	<b>7.9</b>	<b>9.0</b>
Angola	97.2	94.7	93.6	92.7	91.6	91.7	90.3	87.2	82.9	80.9	81.1	79.9	72.3	151.7	26.6	17.5	88.4	7.6	8.7
Ethiopia	95.6	102.5	95.1	84.3	87.2	98.2	88.0	87.6	87.4	87.5	84.8	85.6	..	104.7	6.7	6.4	91.0	5.9	6.5
Mozambique	98.5	95.4	91.9	89.9	89.3	91.0	89.5	89.4	90.8	94.5	87.6	70.5	77.5	97.9	12.1	12.3	89.7	7.4	8.3
Rwanda	102.3	105.0	98.9	88.6	100.5	89.4	86.5	80.0	84.3	79.4	80.9	77.4	69.6	87.9	9.0	10.2	88.6	10.4	11.7
Somalia	98.8	101.3	92.6	92.2	95.7	92.6	92.9	93.7	93.0	88.2	78.0	..	..	104.5	5.6	5.3	93.3	5.9	6.3
Sudan	109.6	88.7	87.5	75.4	93.5	88.7	74.0	92.5	70.1	64.3	83.9	88.9	75.8	102.2	5.1	5.0	85.1	11.7	13.8
<b>Outliers</b>	<b>100.4</b>	<b>102.9</b>	<b>89.7</b>	<b>84.8</b>	<b>91.5</b>	<b>90.4</b>	<b>83.9</b>	<b>88.7</b>	<b>86.7</b>	<b>88.3</b>	<b>87.2</b>	<b>83.5</b>	<b>75.4</b>	<b>124.4</b>	<b>7.9</b>	<b>6.4</b>	<b>88.7</b>	<b>6.5</b>	<b>7.4</b>
Botswana	101.1	98.8	87.3	81.9	88.1	85.0	76.7	85.4	83.1	83.9	82.0	76.6	68.8	131.8	10.9	8.3	84.8	8.0	9.5
Mauritius	98.1	117.4	98.1	94.9	103.5	109.1	108.9	100.2	99.1	103.6	105.2	107.5	98.6	114.3	9.5	8.3	102.2	7.1	7.0
<b>South Africa</b>	<b>108.0</b>	<b>90.6</b>	<b>72.9</b>	<b>79.1</b>	<b>83.8</b>	<b>82.6</b>	<b>85.3</b>	<b>86.0</b>	<b>88.4</b>	<b>80.7</b>	<b>80.6</b>	<b>63.3</b>	<b>73.6</b>	<b>98.4</b>	<b>5.8</b>	<b>5.9</b>	<b>83.7</b>	<b>10.4</b>	<b>12.4</b>
<b>WEST AND CENTRAL AFRICA</b>	<b>100.6</b>	<b>98.9</b>	<b>93.6</b>	<b>95.1</b>	<b>99.4</b>	<b>101.6</b>	<b>97.8</b>	<b>105.7</b>	<b>105.3</b>	<b>106.5</b>	<b>109.3</b>	<b>110.7</b>	<b>111.2</b>	<b>112.1</b>	<b>7.8</b>	<b>6.9</b>	<b>102.6</b>	<b>5.4</b>	<b>5.3</b>
<b>Core Group</b>	<b>99.8</b>	<b>97.2</b>	<b>90.9</b>	<b>95.9</b>	<b>100.2</b>	<b>102.4</b>	<b>98.2</b>	<b>109.9</b>	<b>110.7</b>	<b>116.3</b>	<b>118.9</b>	<b>123.8</b>	<b>125.2</b>	<b>117.0</b>	<b>12.0</b>	<b>10.2</b>	<b>106.6</b>	<b>10.5</b>	<b>9.9</b>
Gambia	117.9	131.0	99.0	101.6	99.7	100.8	99.4	96.5	101.2	81.7	88.1	73.8	75.8	147.8	20.0	13.5	97.0	14.6	15.1
Ghana	95.2	92.1	80.7	109.9	104.7	107.1	108.6	113.9	116.3	91.9	110.9	109.2	114.5	117.7	9.0	7.6	104.0	10.1	9.7
Guinea	102.1	99.8	93.7	95.4	95.6	97.7	95.9	93.6	95.1	96.9	98.3	102.1	98.3	101.3	3.6	3.5	97.7	3.0	3.0
Mauritania	102.3	95.4	88.0	82.8	88.7	89.9	89.7	91.2	93.8	90.2	90.3	81.3	80.5	110.0	11.4	10.4	90.2	6.0	6.7
Nigeria	100.0	97.3	91.7	94.7	100.2	102.4	97.4	111.0	111.4	120.8	121.8	127.9	129.2	117.7	13.6	11.5	107.8	12.1	11.2

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1961-79			1980-93		
														Mean	S.D.	C.V.	Mean	S.D.	C.V.
<b>CFA</b>	<b>102.6</b>	<b>100.2</b>	<b>94.0</b>	<b>91.4</b>	<b>97.8</b>	<b>101.1</b>	<b>96.3</b>	<b>102.1</b>	<b>100.2</b>	<b>96.1</b>	<b>100.3</b>	<b>97.4</b>	<b>97.6</b>	<b>104.9</b>	<b>4.4</b>	<b>4.2</b>	<b>98.2</b>	<b>3.0</b>	<b>3.1</b>
Benin	94.5	93.8	94.6	113.0	114.1	117.1	103.8	118.5	120.6	121.4	125.8	123.9	119.0	99.0	4.5	4.6	111.3	11.4	10.2
Burkina Faso	99.2	99.7	97.8	117.1	125.3	114.5	127.3	121.5	110.3	133.8	133.5	132.2	109.1	10.1	9.3	114.9	13.8	12.0	
Cameroon	99.8	102.8	99.8	93.6	96.3	98.6	90.2	88.3	88.6	88.0	82.6	78.6	78.9	103.8	8.0	7.7	91.8	7.7	8.4
Central African Rep.	100.9	100.5	97.9	93.6	91.6	96.4	96.1	98.4	96.5	94.4	94.2	94.1	94.1	97.7	4.2	4.3	96.4	2.8	2.9
Congo	101.1	103.0	98.6	99.3	98.5	96.1	98.0	97.9	91.0	88.7	79.5	79.1	79.3	107.4	7.0	6.5	93.6	8.3	8.8
Côte d'Ivoire	101.4	92.8	88.7	102.2	98.9	97.3	98.5	104.4	100.6	98.1	93.8	93.3	89.2	87.8	4.9	5.5	97.1	4.7	4.8
Gabon	98.5	92.0	91.1	88.9	86.4	86.4	85.2	85.9	84.8	84.0	81.6	80.2	77.8	109.0	8.7	8.0	87.5	6.5	7.4
Mali	104.5	107.4	103.6	93.0	94.7	99.0	92.7	100.7	96.9	91.3	96.9	88.6	90.8	93.8	6.5	6.9	96.9	5.4	5.6
Niger	97.9	93.6	91.1	66.8	68.5	75.2	66.2	86.5	77.6	77.2	86.0	85.2	77.0	115.3	17.8	15.5	82.2	11.0	13.4
Senegal	118.1	111.7	78.4	81.4	109.7	110.0	117.8	101.2	111.6	102.4	105.5	99.4	111.2	134.0	24.0	17.9	103.2	12.4	12.0
Togo	98.1	93.2	84.8	93.6	91.0	93.7	90.3	96.8	100.6	100.7	93.7	93.0	105.6	112.4	10.7	9.6	95.3	5.1	5.3
<b>Small Economies</b>	<b>108.8</b>	<b>113.6</b>	<b>104.4</b>	<b>113.0</b>	<b>110.6</b>	<b>114.0</b>	<b>112.0</b>	<b>109.7</b>	<b>109.0</b>	<b>112.7</b>	<b>110.5</b>	<b>108.7</b>	<b>110.5</b>	<b>118.2</b>	<b>18.9</b>	<b>16.0</b>	<b>109.3</b>	<b>5.0</b>	<b>4.6</b>
Cape Verde	118.7	42.8	36.5	56.1	75.0	101.8	174.8	165.1	163.7	164.4	125.5	91.6	94.4	100.4	41.9	41.7	108.2	44.8	41.4
Guinea-Bissau	108.8	113.6	104.4	113.0	110.6	114.0	112.0	109.7	109.0	112.7	110.5	108.7	110.5	117.0	13.0	11.1	109.3	5.0	4.6
São Tomé & Príncipe	96.8	87.4	84.4	72.8	76.3	74.4	70.1	78.9	71.8	62.3	60.4	59.3	60.5	156.0	29.6	18.9	74.8	11.6	15.5
<b>Social Unrest</b>	<b>99.6</b>	<b>100.9</b>	<b>100.0</b>	<b>98.0</b>	<b>99.9</b>	<b>100.2</b>	<b>98.9</b>	<b>100.2</b>	<b>99.2</b>	<b>97.4</b>	<b>98.6</b>	<b>97.5</b>	<b>96.3</b>	<b>109.0</b>	<b>4.3</b>	<b>4.0</b>	<b>99.1</b>	<b>1.3</b>	<b>1.3</b>
Chad	94.4	98.3	99.0	83.6	98.0	99.3	97.1	109.4	101.2	97.2	106.6	107.3	99.2	107.7	8.5	7.9	99.5	6.1	6.1
Liberia	100.9	101.3	101.3	100.4	98.9	96.8	96.7	95.0	94.7	67.2	64.6	62.1	58.0	98.4	6.6	6.7	88.3	16.2	18.4
Sierra Leone	100.0	104.6	96.6	99.8	93.9	102.5	96.9	97.6	98.1	95.3	94.0	83.7	85.6	105.5	4.7	4.5	96.4	5.6	5.8
Zaire	100.4	101.0	100.5	100.0	100.8	100.3	99.6	99.4	99.3	99.9	100.3	99.9	99.7	110.3	5.4	4.9	100.1	0.5	0.5
<b>NORTH AFRICA</b>	<b>95.5</b>	<b>102.2</b>	<b>101.3</b>	<b>99.7</b>	<b>107.7</b>	<b>112.9</b>	<b>112.2</b>	<b>114.6</b>	<b>118.2</b>	<b>118.2</b>	<b>127.6</b>	<b>117.8</b>	<b>112.6</b>	<b>105.8</b>	<b>5.0</b>	<b>4.8</b>	<b>110.2</b>	<b>8.7</b>	<b>7.9</b>
Algeria	97.1	94.0	97.1	95.7	113.0	105.1	111.9	105.3	115.0	111.6	133.2	126.8	119.1	111.0	11.3	10.2	109.4	11.3	10.3
Egypt	98.7	101.9	103.6	101.7	105.9	110.0	112.7	111.7	111.6	115.9	117.8	119.4	113.6	104.5	3.7	3.6	108.8	6.7	6.1
Libya	92.4	104.6	106.8	93.0	90.4	80.8	65.9	63.9	71.0	72.3	73.8	83.9	81.4	83.5	18.1	21.6	84.3	13.4	16.0
Morocco	85.9	111.1	98.0	98.3	106.8	129.6	112.8	137.6	143.8	132.0	149.6	109.5	106.1	109.5	11.2	10.3	116.2	18.3	15.8
Tunisia	99.5	87.6	103.6	99.0	123.0	102.4	121.4	83.2	97.3	114.6	135.2	121.4	123.0	98.5	10.2	10.4	108.4	14.5	13.4

Sources:

FAO. 1986. Production Yearbook, Vol. 40, Tables 9, 10 and 13, pp. 47, 49 and 55, Food and Agriculture Organization of the United Nations, Rome.

FAO. 1991. Production Yearbook, Vol. 45, Tables 9, 10 and 13, pp. 49, 51 and 57, Food and Agriculture Organization of the United Nations, Rome.

FAO. 1993. Production Yearbook, Vol. 47, Tables 3, 9, 10, 13 and 15, pp. 19-23, 49, 51, 57 and 65, Food and Agriculture Organization of the United Nations, Rome.

Notes: Weighted average indices for sub-groups have been calculated by using agricultural population as the appropriate available weights.

TABLE A3  
SOURCES OF CALORIES PER CAPUT PER DAY IN AFRICA  
(FAO FOOD BALANCE SHEET)

	VEGETABLE PRODUCTS				ANIMAL PRODUCTS			
	1961-63	1969-71	1979-81	1988-90	1961-63	1969-71	1979-81	1988-90
World	1927	2052	2179	2272	359	381	400	424
Developing Countries	1798	1957	2129	2233	142	161	195	240
Africa	1979	1992	2029	2062	138	146	152	142
Latin America	1969	2091	2221	2217	394	411	472	472
Near East	1990	2194	2530	2669	246	243	315	285
Far East	1729	1911	2096	2226	96	118	149	216
Other Developing Countries	1893	2017	2099	2293	222	274	326	333
% of Africa to the World	102.7	97.1	93.1	90.8	38.4	38.3	38	33.5
% of Africa to the Dev. Countries	110.1	101.8	95.3	92.3	97.2	90.7	77.9	59.2
<b>EAST AND SOUTHERN AFRICA</b>	<b>1814.5</b>	<b>1904.1</b>	<b>1954.7</b>	<b>1869.6</b>	<b>199.3</b>	<b>209.2</b>	<b>219.5</b>	<b>205.4</b>
<b>Core Group</b>	<b>1922.9</b>	<b>1982.3</b>	<b>2046.5</b>	<b>1957.9</b>	<b>166.9</b>	<b>173.4</b>	<b>166.1</b>	<b>170.2</b>
Burundi	2003	2039	1997	1900	45	60	62	48
Kenya	1918	1996	1912	1766	240	234	235	298
Lesotho	1857	1878	2195	1978	139	127	158	144
Madagascar	2084	2177	2199	1911	282	284	273	245
Malawi	1994	2271	2180	1980	72	99	94	68
Tanzania	1657	1644	2101	2053	143	160	139	142
Uganda	2147	2140	1970	2044	146	135	144	133
Zambia	1963	2030	2060	1918	131	163	126	98
Zimbabwe	1906	1990	2034	2109	147	150	145	146
<b>Small Economies</b>	<b>1817.6</b>	<b>1884.7</b>	<b>1938.5</b>	<b>2078.4</b>	<b>213.5</b>	<b>212.4</b>	<b>242.5</b>	<b>191.0</b>
Comoros	1817	1793	1688	1671	62	90	96	89
Reunion	2041	2136	2291	2485	360	425	529	598
Seychelles	1701	1733	1903	1998	153	212	379	358
Swaziland	1829	1966	2125	2384	330	302	337	250
<b>Social Unrest</b>	<b>1583.6</b>	<b>1739.6</b>	<b>1759.9</b>	<b>1666.1</b>	<b>263.6</b>	<b>280.1</b>	<b>324.6</b>	<b>273.2</b>
Mozambique	1894	1850	1895	1754	58	68	56	51
Rwanda	1782	2011	2006	1859	38	37	58	54
Somalia	1079	1018	1258	1285	641	716	684	590
Sudan	1528	1850	1788	1694	312	317	426	350
<b>Outliers</b>	<b>1939.6</b>	<b>1957.0</b>	<b>2054.1</b>	<b>2211.7</b>	<b>264.9</b>	<b>293.6</b>	<b>352.0</b>	<b>341.3</b>
Botswana	1682	1773	1768	1938	350	392	387	322
Mauritius*	2242	2173	2390	2533	165	178	311	364
<b>South Africa</b>	<b>2243</b>	<b>2353</b>	<b>2539</b>	<b>2716</b>	<b>439</b>	<b>466</b>	<b>442</b>	<b>417</b>

	VEGETABLE PRODUCTS				ANIMAL PRODUCTS			
	1961-63	1969-71	1979-81	1988-90	1961-63	1969-71	1979-81	1988-90
<b>WEST AND CENTRAL AFRICA</b>	<b>2189.0</b>	<b>2148.7</b>	<b>2050.1</b>	<b>2121.1</b>	<b>97.0</b>	<b>107.4</b>	<b>115.0</b>	<b>91.7</b>
<b>Core Group</b>	<b>2318.9</b>	<b>2223.4</b>	<b>2007.7</b>	<b>2129.4</b>	<b>82.3</b>	<b>90.4</b>	<b>108.6</b>	<b>70.4</b>
Gambia	2139	2080	1980	2153	97	123	121	137
Ghana	1932	2095	1870	2038	98	132	102	106
Guinea	2157	2122	2186	2160	52	50	82	82
Mauritania	1367	1342	1550	1981	600	602	531	466
Nigeria	2400	2264	2026	2143	72	77	103	57
<b>CFA</b>	<b>2009.0</b>	<b>2032.7</b>	<b>2112.3</b>	<b>2146.1</b>	<b>131.1</b>	<b>152.1</b>	<b>155.5</b>	<b>149.4</b>
Benin	1963	2022	2044	2279	75	94	101	104
Burkina Faso	1779	1684	1726	2120	76	93	89	99
Cameroon	2040	2199	2205	2057	100	113	135	151
Central African Rep	2074	2163	1958	1629	93	133	177	217
Congo	2076	1977	2104	2129	106	113	131	166
Côte d'Ivoire	2087	2272	2663	2423	104	149	181	145
Mali	1937	1734	1658	2063	230	265	240	197
Niger	1869	1806	2055	2127	180	183	169	113
Senegal	2190	2261	2235	2110	206	210	180	213
Togo	2309	2303	2195	2166	66	74	71	102
<b>Small Economies</b>	<b>1835.4</b>	<b>1835.3</b>	<b>2218.9</b>	<b>2355.2</b>	<b>79.9</b>	<b>153.4</b>	<b>237.2</b>	<b>268.7</b>
Cape Verde	1756	1770	2318	2458	74	161	268	320
São Tomé & Príncipe	2078	2035	1916	2041	98	130	143	112
<b>Social Unrest</b>	<b>2090.0</b>	<b>2112.9</b>	<b>2076.4</b>	<b>2053.8</b>	<b>86.8</b>	<b>86.7</b>	<b>68.8</b>	<b>62.2</b>
Liberia	2012	2113	2293	2173	97	102	107	86
Sierra Leone	1758	2012	1999	1832	70	84	97	67
Zaire	2132	2124	2070	2070	88	86	63	60
<b>NORTH AFRICA</b>	<b>1939.3</b>	<b>2106.2</b>	<b>2649.7</b>	<b>2889.6</b>	<b>162.0</b>	<b>182.4</b>	<b>244.3</b>	<b>265.8</b>
Algeria	1552	1645	2347	2622	171	179	264	322
Egypt	2130	2272	2857	3052	157	170	231	257
Libya	1474	2090	2890	2828	168	345	581	466
Morocco	2025	2221	2505	2845	159	185	191	186
Tunisia	1902	2113	2556	2840	172	173	243	282

Source:

FAO. 1992a. Production Yearbook, Vol. 46, Table 106, pp. 253-254, Food and Agriculture Organization of the United Nations, Rome.

TABLE A4. PER CAPITA GRAIN PRODUCTION IN AFRICA, 1961-93 (IN KG)

YEAR	Cereals	Wheat	Maize	Rice	Cassava	Yams
1961	6257	176	1827	629	6308	474
1962	6375	173	1788	704	6284	551
1963	6307	180	1762	681	6254	540
1964	6178	187	1780	713	6235	540
1965	5954	174	1794	663	6362	533
1966	5571	168	1801	678	6188	514
1967	6175	176	1963	749	6197	532
1968	5626	188	1816	735	6093	478
1969	6221	193	1946	743	6097	541
1970	5874	198	1744	738	6392	558
1971	5892	199	1919	749	6073	484
1972	5337	180	1895	720	6103	457
1973	5526	176	1784	745	6011	553
1974	5942	201	1832	776	6015	562
1975	5835	175	2040	785	6409	506
1976	5617	187	2027	767	6210	463
1977	5413	163	1930	736	6197	426
1978	5303	175	1827	727	6019	416
1979	5012	155	1635	718	5951	411
1980	5036	174	1547	739	5776	391
1981	5270	177	1748	730	5814	380
1982	5020	187	1682	728	6030	352
1983	4632	151	1553	710	5793	324
1984	4414	135	1521	710	5886	345
1985	5498	152	1864	737	6077	362
1986	5656	175	1949	754	6098	378
1987	4916	154	1639	768	5969	288
1988	5846	166	1982	789	5959	299
1989	5469	175	1982	929	5916	299
1990	4807	183	1674	823	6197	259
1991	5089	198	1633	882	6163	293
1992	4670	184	1316	881	6107	281
1993	4892	164	1690	907	5980	273
C.V. 1961-93	9.60%	8.54%	9.01%	8.75%	2.68%	23.40%
C.V. 1980-93	8.35%	9.30%	10.08%	8.03%	1.85%	10.37%

Source:

FAO 1994. FAO STAT TS, Food and Agriculture Organization of the United Nations, Rome.

TABLE A5. INSTABILITY INDICES OF MARKET PRICES FOR SELECTED  
PRIMARY COMMODITIES, 1970-93  
(IN PER CENT)

Commodity	Instability index		
	1970-79	1980-89	1990-93
<b>Total food</b>	22.0	14.6	3.0
<b>Food and tropical beverages</b>	22.8	15.8	3.5
<b>Tropical beverages</b>	20.0	12.7	7.5
Coffee	23.7	14.5	10.0
Cocoa	22.5	14.8	9.7
Tea	13.0	17.2	9.8
<b>Food</b>	30.3	22.2	3.9
Sugar	58.1	50.6	13.4
Soybean meal	22.3	15.2	2.8
Rice	34.4	21.9	7.3
Bananas	12.0	13.4	18.6
Maize	19.8	14.5	4.4
Wheat	27.8	11.0	10.5
Beef	15.5	7.1	4.1
Fishmeal	26.7	18.4	11.3
Pepper	16.3	31.7	19.4
<b>Vegetable oilseeds and oils</b>	19.2	18.5	3.5
Palm oil	19.7	22.2	7.2
Soybeans	19.3	13.7	3.6
Soybean oil	23.2	19.2	4.7
Coconut oil	32.2	29.5	19.1
Sunflower oil	22.1	18.3	6.8
Palm kernel oil	33.0	28.0	17.7
Groundnuts	15.9	11.5	0.4
Groundnut oil	17.9	24.8	14.1
Copra	34.4	27.7	18.0
Palm kernels	29.1	28.3	7.1
<b>Agricultural raw materials</b>	11.8	9.6	2.9
Rubber	17.2	17.0	3.5
Cotton (medium)	15.0	12.6	8.4
Tobacco	2.9	7.9	4.1
Tropical sawnwood	13.7	11.2	5.8
Tropical logs	16.1	15.8	5.1
Plywood	19.7	14.3	12.6
Hides and skins	19.7	13.6	20.0
Wool	27.2	19.6	7.2
Jute	10.0	25.5	9.3
Linseed oil	45.2	22.9	16.2
Sisal	41.4	6.3	10.5

Commodity	Instability index		
	1970-79	1980-89	1990-93
<b>Minerals, ores and metals</b>	12.8	17.0	3.9
Copper	21.3	22.7	6.0
Aluminium	13.6	23.2	6.4
Iron ore	9.1	5.0	2.0
Tin	11.5	14.7	6.7
Phosphate rock	45.0	11.5	4.0
Nickel	1.2	35.8	8.0
Zinc	35.9	19.3	10.0
Lead	20.2	26.0	9.6
Manganese ore	15.1	18.8	11.5
Tungsten	26.8	14.0	18.1
<b>All commodities</b>			
In current dollars	17.4	14.4	1.9
In terms of SDR's	14.8	9.5	2.7

Source:

UNCTAD (1994:26-27), Table 2.4.



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