NUTRITION COUNTRY PROFILE

REPUBLIC OF KENYA

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Summary

Kenya is a country with a predominantly rural and very young population. About 80% of the land area is arid and semi-arid, mainly in the northern and eastern regions. Areas with a good agricultural potential represent only about 18% of the territory but support 80% of the population. Agriculture, mainly rainfed, is the main sector of the Kenyan economy. The country is recurrently affected by drought, floods and environmental degradation due to over-exploitation of natural resources.

Stagnation of food production, an unfavourable economic environment and poverty are the major causes of food insecurity in the country. Public expenditures have declined in the past decade, causing a deterioration of infrastructure, education and health services. The persistence of malaria and the progression of the HIV/AIDS epidemic have contributed to the fall in life expectancy and the rise in mortality rates, particularly for infants and under-fives. Immunization coverage has also regressed since the 1990's. Population groups most affected by these negative trends are the rural, the lesser educated, the female-headed households, as well as populations living in the arid and semi-arid areas, in urban slums and in peri-urban settlements.

The national dietary energy supply barely meets population energy requirements, resulting in undernourishment for a third of the population. Nevertheless, the prevalence of undernourishment has declined, albeit slowly, during the last decade. Although cereals, sugar and vegetable oil supply almost two thirds of the dietary energy, the diversity of the diet is improving gradually. Supplies of fruit, vegetables and milk are increasing.

Some infant feeding practices are highly beneficial to the health of children, particularly universal breastfeeding, but others such as the low rate of exclusive breastfeeding and bottle-feeding are not. Inadequate infant feeding practices combined with food insecurity of households and low access to health services lead to a high prevalence of undernutrition among young children, particularly in the North Eastern, Eastern and Coastal provinces. Overall, during the last decade, prevalence of underweight, stunting and wasting have not declined. Women are also affected by chronic energy deficiency. While undernutrition persists at high levels, overnutrition is emerging among urban adults.

Undernutrition is associated with widespread micronutrient deficiencies. Although recent data are not available, it is likely that iodine deficiency disorders are still prevalent. The national programme of iodization of salt needs to be evaluated. Vitamin A deficiency and iron deficiency anemia are both highly prevalent in the country. The implementation of supplementation in vitamin A and iron is still insufficient. More long-term strategies are needed such as fortification, dietary diversification and nutritional education.

Summary Table

Basic Indicators				Year
Population				
Total population		31.916	million	2003
Rural population		75-80	%	2002
Population under 15 years of age		44	%	2000
Annual population growth rate		2.2	%	2000/05
Life expectancy at birth		47	years	2000/05
Agriculture				
Agricultural area		46	%	2002
Arable and permanent cropland per agricultural inhabitant		0.2	Ha	2002
Level of development				
Human development and poverty				
Human development index		0.488	[0-1]	2002
Proportion of population living with less than 1$ a day (PPP)	***MDG1***	23	%	1990/2002
Population living below the national poverty line	***MDG1***	52	%	1990/2001
Education				
Net primary enrolment ratio	***MDG2***	66	%	2002/03
Youth literacy (15-24 years)	***MDG2***	96	%	2002
Ratio of girls to boys in primary education	***MDG3***	1	girl per 1 boy	2002/03
Health				
Infant mortality rate	***MDG4***	77	‰	2003
Under-five mortality rate	***MDG4***	115	‰	2003
Maternal mortality ratio adjusted	***MDG5***	1 000	per 100 000 live births	2000
Malaria-related mortality rate in under-fives	***MDG6***	334	per 100 000 deaths	2000
Environment				
Sustainable access to an improved water source in rural area	***MDG7***	46	% of population	2002
Nutrition indicators				*Year*
Energy requirements				
Population energy requirements		2 095	kcal per capita/day	2001
Food supply				
Dietary Energy Supply (DES)		2 117	kcal per capita/day	2001
Prevalence of undernourishment	***MDG1***	33	%	2000/02
Share of protein in DES		11	%	2000/02
Share of lipids in DES		20	%	2000/02
Food diversification index		45	%	2000/02
Food consumption				
Average energy intake (per capita or per adult)		n.a.		
Percent of energy from protein		n.a.		
Percent of energy from lipids		n.a.		
Infant and young child feeding	**Age**			
Exclusive breastfeeding rate	<6 months	13	%	2003
Timely complementary feeding rate	6-9 months	84	%	2003
Bottle-feeding rate	0-11 months	28	%	2003
Continued breastfeeding rate at 2 years of age		57	%	2003
Nutritional anthropometry				
Stunting in children under 5 years		30	%	2003
Wasting in children under 5 years		6	%	2003
Underweight in children under 5 years	***MDG1***	20	%	2003
Women with BMI<18.5 kg/m^2		12	%	2003
Micronutrient deficiencies				
Prevalence of goitre in school-age children		16	%	1994
Percentage of households consuming adequately iodized salt		91	%	2000
Prevalence of sub-clinical vitamin A deficiency in preschool children		84	%	1999
Prevalence of vitamin A supplementation in preschool children		33	%	2003
Prevalence of vitamin A supplementation in mothers		14	%	2003
Prevalence of anemia in women		56	%	1999
Prevalence of iron supplementation in mothers		41	%	2003

MDG: Millennium Development Goal; n.a.: not available

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Acronyms

BMI	Body mass index
CBS	Central Bureau of Statistics (Kenya)
CED	Chronic energy deficiency
DES	Dietary energy supply
DHS	Demographic and Health Survey
DPT3	Diphtheria, pertussis (whooping cough) and tetanus vaccine – three doses
EC	European Commission
FAO	Food and Agriculture Organization of the United Nations
FAOSTAT	FAO Statistical Databases
FEWS	Famine Early Warning Systems Network
FIVIMS	Food Insecurity and Vulnerability Information and Mapping Systems
GDP	Gross domestic product
GOK	Government of Kenya
HIV/AIDS	Human immunodeficiency virus/ acquired immunodeficiency syndrome
ICCIDD	International Council for Control of iodine Deficiency Disorders
IDA	Iron deficiency anemia
IDD	Iodine deficiency disorders
ILO	International Labour Organization
IMF	International Monetary Fund
ITU	International Telecommunication Union
MDG	Millennium Development Goals
MICS	Multiple Indicator Cluster Survey
MFP	Ministry of Finance and Planning (Kenya)
MOH	Ministry of Health (Kenya)
MPND	Ministry of Planning and National Development
NCPD	National Council for Population and Development
NFNP	National Food and Nutrition Policy
PPP	Purchase power parity
ROK	Republic of Kenya
SOFI	The State of Food Insecurity in the World
SuRF	Surveillance of chronic disease Risk Factors
UN	United Nations
UNAIDS	Joint United Nations Programme on HIV/AIDS
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations Children's Fund
UNPD	United Nations Population Division
UNSTAT	United Nations Statistics Division
VAD	Vitamin A deficiency
WB	World Bank
WFP	World Food Programme
WHO	World Health Organization

Part I: Overview and basic indicators

I.1 Context

Situated in East Africa, Kenya is bordered by Tanzania to the south, Uganda to the west, Ethiopia to the north, Sudan to the north-west, Somalia to the east, and the Indian Ocean to the south-east. Its area is approximately of 584 000 km^2, divided into 8 provinces and 72 districts. The coastline and the port in Mombasa enable the country to trade easily with other countries. The country falls into two regions: lowlands, including coastal and lake basin lowlands, and highlands, which extend on both sides of the Great Rift Valley. Approximately 80% of the land area of the country is arid or semiarid.

Kenya has climatic and ecological extremes with altitude varying from sea level to over 5000 m in the highlands, in the south-eastern part of the country. Rainfall and temperatures are influenced by altitude and proximity to lakes or the ocean. The mean annual rainfall ranges from less than 250 mm in semi-arid and arid areas to more then 2000 mm in areas with high agricultural potential (FAO, Forestry Division).

There are four seasons in the year: a dry period from January to March, the long rainy season from March to May, followed by a long dry spell from May to October and the short rains between October and December. The country is disaster-prone, experiencing droughts and floods. The arid and semi-arid lands in the northern part of the country are the most affected by droughts (CBS, MOH & ORC Macro, 2004; WFP, 2005a).

The population is comprised of about 42 ethnic groups. Major tribes include the Kikuyu, Luo, Kalenjin, Luhya, Kamba, Kisii, Mijikenda, Somali, and Meru. English is the official language while Kiswahili is the national language (CBS, MOH & ORC Macro, 2004).

I.2 Population

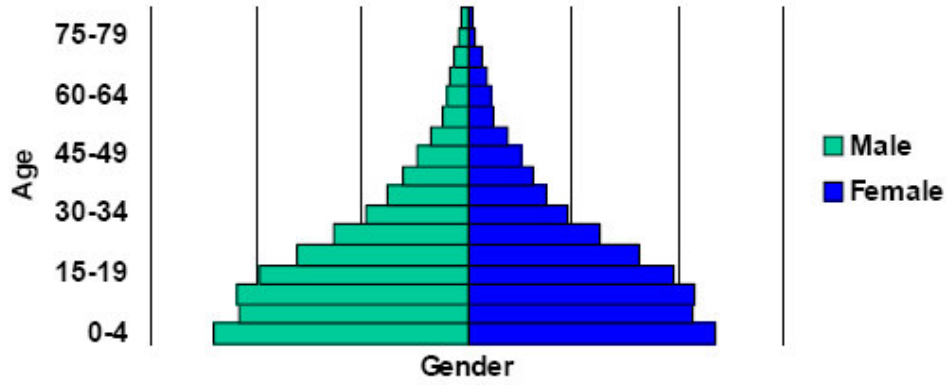
Population indicators

Kenya's population is young, and still predominantly rural despite rural-urban migration. Annual population growth rate declined from 3.4% in 1969-1989 to 2.9% in 1989-1999, and is now estimated at 2.2%. This trend is due to a decline in fertility rates since the mid-1980s and is the result of efforts deployed in the framework of the National Population Policy for Sustainable Development (NCPD, 2000). Mortality rates have increased since the 1980s, presumably due to the HIV/AIDS epidemic, deterioration of health services, and widespread poverty (CBS, MOH & ORC Macro, 2004).

Table 1: Population indicators

Indicator	Estimate	Unit	Reference Period	Source
Total population	31.916	millions	2003	WB
Annual population growth rate	2.2	%	2000-2005	UNPD
Crude birth rate	38.8	‰	2000-2005	UNPD
Population distribution by age:			2000	UNPD
0-4 years	16	%		
5-14 years	28	%		
15-24 years	22	%		
60 and over	4	%		
Rural population	75-80	%	2002	UN & MPND
Agricultural population	74	%	2004	FAOSTAT
Population density	53	inhabitants per km^2	2000	UNPD
Median age	17	years	2000	UNPD
Life expectancy at birth	47	years	2000-2005	UNPD
Population sex ratio	99.4	males per 100 female	2000	UNDP
Net migration rate	-1.3	‰	2000-2005	UNPD
Total dependency rate	88	%	2000	UNPD

Population pyramid for 2001



Source: UNAIDS, 2002

I.3 Agriculture

Although its share in the GDP is declining (from 23% in 1999 to 16% in 2003), agriculture remains a major sector for the Kenyan economy (WB, World Development Indicators Database). About 74% of the economically active population works in agriculture, and of these about 80% are smallholders. Agriculture in Kenya is predominantly rain fed (FAO, 2005). Coffee, tea, and horticulture (flowers, fruits, and vegetables) are the main agricultural export commodities; in 2002, the three commodities accounted for 53% of total export earnings (CBS, 2003).

About 18% of the land area is high to medium potential agricultural land, and supports 80% of the population. The remaining 20% of the population lives in the remaining 80% of the land which is arid and semi-arid, and characterized by low, unreliable and poorly distributed rainfall. These areas are used for pastoral farming (UN & MPND, 2003; FAO, Country Pasture/Forage Resource Profiles).

Widespread poverty in rural areas leads to over-exploitation of natural resources. Uncontrolled forest logging and unsustainable agriculture are reducing the vegetal capital stock and decreasing the water retention capacity of the soil and are causing increased erosion (UN & MPND, 2003; FAO, Country Pasture/Forage Resource Profiles). Agricultural productivity is also affected negatively by a land tenure system that encourages uncontrolled fragmentation of land into small uneconomic production units (EC & FIVIMS, 2004).

Land use and irrigation statistics

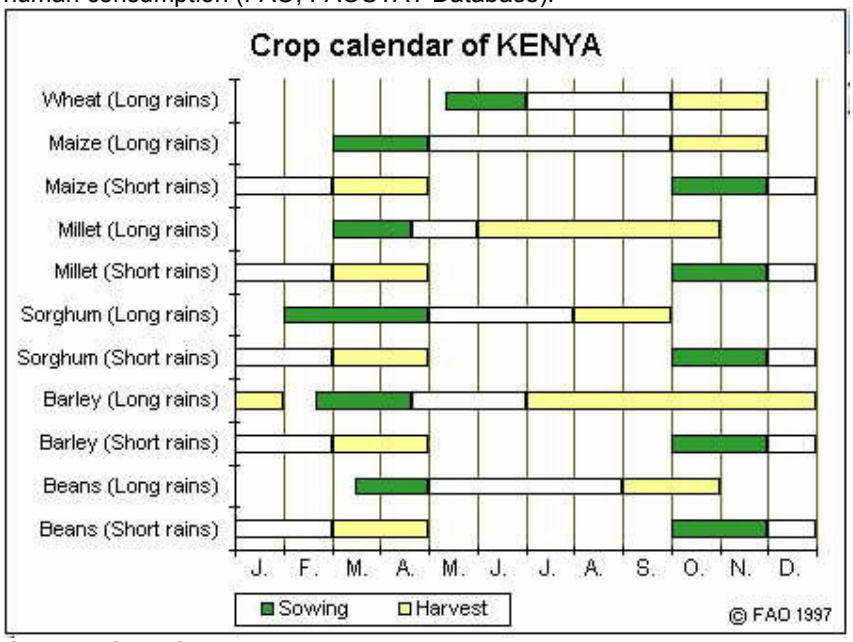
Table 2: Land use and irrigation

Type of area	Estimate	Unit	Reference period	Source
Total Land Area	56 914	1000 Ha	2002	FAO
Agricultural Area	46	%	2002	FAO
Arable lands & Permanent Crops	9	%	2002	FAO
Permanent Crops	1	%	2002	FAO
Permanent Pasture	37	%	2002	FAO
Forested land areas	30	%	2000	FAO
Irrigated agricultural land	<1	%	2002	FAO
Arable & Permanent cropland in Ha per agricultural inhabitant	0.2	Ha	2002	FAO

N.B. Percents are calculated on the total land area.

Main crops, agricultural calendar, seasonal food shortage

The main food commodities produced in Kenya in 2002 where sugar cane, cow milk, maize, potatoes, plantains and cassava (FAO, Statistics Division). All of these commodities are mainly used for local human consumption (FAO, FAOSTAT Database).



Source : GIEWS

The food shortage season corresponds to the peak of the dry season, from July to September (CBS, MOH & ORC Macro, 2004).

Livestock production and fishery

Livestock production plays a major role in the food security and the economy of the country since it sustains the livelihood of the population living in the arid and semi-arid areas (FAO, 2005).

Fish consumption varies considerably between different geographical regions and population groups within the country. It is highest in the vicinity of the principal fisheries (mainly inland freshwater fisheries) and in the major towns, and lowest in traditionally pastoral areas in the north and parts of the Rift Valley (FAO, 2001).

Table 3: Livestock and fishery statistics

Livestock production and fishery	Estimate	Unit	Reference period	Source
Cattle	11 500 000	number of heads	2002	FAO
Sheep and Goats	18 313 476	number of heads	2002	FAO
Poultry Birds	28 000	thousands	2002	FAO
Fish catch and aquaculture	33 666	tons	2002	FAO

I.4 Economy

Industry and agriculture are major components of the economy of Kenya. Despite a recent decline, tourism is a sector of major economic importance (CBS, MOH & ORC Macro, 2004).

In the 1960's, after Kenya's independence, the economy grew by about 7% annually, thanks to good performances of both the manufacturing sector and agricultural production. Since the 1970's, there has been a consistent decline in the economy, reaching the lowest annual GDP growth level of about 2% between 1996 and 2002. Growth of GDP has failed to keep pace with population growth. The weak performance of the economy has been due to external shocks and internal structural problems, including the drought of the 1980s, low commodity prices, world recession, bad weather, poor governance and inadequate infrastructure (CBS, MOH & ORC Macro, 2004; IMF, 2005).

Table 4: Basic economic indicators

Indicator	Estimate	Unit	Reference Period	Source
Gross Domestic Product per capita	1 020	PPP US $	2002	UNDP
GDP annual growth	2	%	2003	WB
Gross National Income per capita	400	$	2003	WB
Industry as % of GDP	19	%	2003	WB
Agriculture as % of GDP	16	%	2003	WB
Services as % of GDP	65	%	2003	WB
Paved roads as % of total roads	12	%	2000	WB
Internet users	1.3	per 10 000 people	2002	ITU
Total debt service as % of GDP	3.7	%	2002	WB
Military Public expenditure	1.7	% of GDP	2002	UNDP

Kenya's export basket mainly comprises agricultural commodities, while manufactured products account for less than 40% of total exports. Non-food imports are constituted mainly by petrol (16%), chemicals (14%), machinery and transport equipment (32%) and other manufactured goods (16%) (IMF, 2005).

I.5 Social indicators

Health indicators

Infant and under-five mortality rates are stagnating or increasing, from 73‰ and 105‰ respectively in 1989-1993 to 77‰ and 115‰ in 2003. The under-five mortality rate is higher in rural areas. The rates vary greatly by province, and according to mothers' level of education. Except for neonatal mortality,

all childhood mortality indicators were highest in Nyanza Province and lowest in the Central Province (CBS, MOH & ORC Macro, 2004). Childhood vaccination coverage has also deteriorated, with a fall of the proportion of children aged 12-23 months fully vaccinated from 79% in 1993 to 52% in 2003 (IMF, 2005). The level of maternal mortality is very high (UN & MPND, 2003).

The HIV/AIDS pandemic has compounded the deteriorating health standards, particularly in urban areas, in Nairobi and also in the Nyanza Province. The pandemic has caused a steep rise in the number of orphans, growing destitution, and unprecedented levels of poverty. Malaria also remains a major health problem in Kenya, with both health and economic consequences such as loss of income and incapacity to work (CBS, MOH & ORC Macro, 2004).

Table 5: Health indicators

Indicator	Estimate	Unit	Reference Period	Source
Mortality				
Infant mortality	77	‰	2003	UNICEF/DHS
Under-five mortality	115	‰	2003	UNICEF/DHS
Maternal mortality ratio :				UNICEF
reported	414	per 100 000 live births	2003	UNICEF/DHS
adjusted	1000	per 100 000 live births	2000	UNICEF
Morbidity				
Malaria-related mortality rate in under-fives	334	per 100 000 deaths in under-fives	2000	UNSTAT
Percent of under-fives sleeping under a treated bed net	5	%	2003	DHS
Prevalence of diarrhoea in the last 2 weeks in under-fives	16	%	2003	DHS
Oral Rehydration rate among under-fives	15/50	%	1994-2003/2003	UNICEF/MICS-DHS
Percentage of under-fives with acute respiratory infections in the last 2 weeks	18	%	1998-2003	UNICEF/MICS
Tuberculosis prevalence	821	per 100 000 people	2003	UNSTAT
HIV/AIDS				
Prevalence of HIV/AIDS cases in adults	7	%	2003	UNSTAT
Percentage of women (15-24) who know that a person can protect herself from HIV infection by consistent condom use	59	%	2003	UNSTAT
Immunization				
Percent of infants with immunization against tuberculosis at 1 year of age	87	%	2003	UNICEF/WHO
Percent of infants with DTP3 immunization at 1 year of age	73	%	2003	UNICEF/WHO
Percent of infants with immunization against measles at 1 year of age	72	%	2003	UNICEF/WHO
Percent of pregnant women immunized against tetanus	66	%	2003	UNICEF/MICS

Water and sanitation

Results from MICS 2000 and KDHS 1989, 1993 and 1998 show that there has been no improvement in access to improved water sources in the past decade. Most of the rural population still uses only unprotected wells, springs and boreholes (UN & MPND, 2003). Concerning data on access to

sanitation (see table below), access to improved sanitation is underestimated as simple or traditional pit latrines were not classified as improved sanitation in urban areas (UN & MPND, 2003).

Table 6: Access to safe water and sanitation

Indicator	Estimate	Unit	Reference period	Source
Sustainable access to an improved water source:				
Urban	89	% of population	2002	WHO
Rural	46	% of population	2002	WHO
Access to improved sanitation:				
Combined urban/rural	48	% of population	2002	UNICEF

Access to health services

There has been a general decline in the country's provision of health services, due to the increasing burden of disease and poor performance of the economy coupled with demographic pressure. This decline has been reflected by diminishing per capita allocations for health over the years (UN &MPND, 2003), and by a slight decrease in pregnant women's access to antenatal care since 1998, both in terms of quantity and quality (CBS, MOH & ORC Macro, 2004).

Table 7: Access to Health Services

Indicator	Estimate	Unit	Reference Period	Source
Health personnel: number of physicians	14	per 100 000 people	1990-2003	WHO
Population with sustainable access to affordable essential drugs	very low access *		1999	UNDP
% of births attended by skilled health personnel	44	%	1995-2002	UNICEF
Public expenditure on Health	1.7	% of GDP	2001	UNESCO

* estimated at 0-49% of total population

Education

Kenya experienced a decrease in the net enrolment rate in primary education in the past decade, from 80% in 1990 (UN & MPND, 2003) to 66% in 2003 (UNESCO, 2004). This was due to several factors, among others, Kenya's previous cost-sharing policy and differential geographic access to educational facilities (UN & MPND, 2003). The negative trend in enrolment and retention is likely to be reversed as the Government of Kenya has now introduced free primary education. It is estimated that the goal of universal primary education will be achieved by the year 2015 (UN & MPND, 2003). There are no gender differences in rates of enrolment, retention and completion at primary and secondary levels in Kenya.

Table 8: Education

Indicator	Estimate	Unit	Reference Period	Source
Adult literacy	84	%	2002	UNESCO
Adult literacy rate : females as % of males	87	%	2002	UNESCO
Youth literacy (15-24 years)	96	%	2002	UNESCO
Net primary enrolment rate	66	%	2002-2003	UNESCO
Grade 5 completion rate	59	%	2002-2003	UNESCO
Ratio of girls to boys in primary education	1.00	number of girls per 1 boy	2002-2003	UNESCO
Public expenditure on education	6.2	% of GDP	1999-2001	UNESCO

Level of development, poverty

The key determinants of poverty in Kenya are the following: a rural location, a large size of households, low levels of education of heads of households, female headed households, subsistence farming, low access to land, lack of ownership of livestock and lack of durable farm tools.

It is estimated that the proportion of the population living below the national poverty line has risen from about 49% in 1990, to 55% in 2001, and up to 56% in 2003. Unemployment has also increased, affecting 15% of the labour force in 2003 (EC & FIVIMS, 2004). Three quarters of the poor live in rural areas. The urban poor live in slum and peri-urban settlements (IMF, 2005).

The Kenyan government has recently established a Poverty Analysis and Research Unit in the Central Bureau of Statistics, in collaboration with the World Bank. The information produced by this unit will be used for designing targeted poverty interventions and to monitor and evaluate the Economic Recovery Strategy (ERS) and the Millennium Development Goals (MDGs) (IMF, 2005).

Table 9: Human development and poverty

Indicator	Estimate	Unit	Reference period	Source
Human development index	0.488	value between 0-1	2002	UNDP
Proportion of population living with less than 1$ a day (PPP)	23.0	%	1997	UNSTAT
Population living below the national poverty line	52.0	%	1990-2001	UNDP
Human poverty index (HPI-1)	37.5	%	2002	UNDP

Other social indicators

The practice of female genital cutting is decreasing in Kenya, with a current 32% of women circumcised. Marital violence remains an issue with almost half of ever-married women reporting to have suffered emotional, physical or sexual violence (CBS, MOH & ORC Macro, 2004). Although gender disparities continue to be of concern, there has been some improvement over the years in the sectors of education, employment and politics (UN, 2001; UN & MPND, 2003).

Child labour has been identified as one of the factors explaining declining enrolment rates in primary school (UN & MPND, 2003). Currently it is estimated that child labour concerns 1.3 million children, mainly working in commercial agriculture, fishing and domestic services. Child labour is due to poverty and is increasing with the spread of the HIV/AIDS pandemic (IMF, 2005).

Table 10: Other social indicators

Indicator	Estimate	Unit	Reference period	Source
Gender related development index (GDI)	0.486	value between 0-1	2002	UNDP
Women's wage employment in non-agricultural sector as % of total non agricultural employees	32	%	1997	UNSTAT
Ratification of ILO Convention 182 on The Worst Forms of Child Labour	ratified		2001	ILO

Part II: Food and nutrition situation

II.1 Qualitative aspects of the diet and food security

Food consumption patterns

Maize is the basic staple of the Kenyan diet. *Ugali*, the main dish, is a thick porridge of maize meal that is usually eaten with a sauce of vegetables or meat, or simply accompanied with fermented milk. Dishes of boiled maize and beans (*githeri*) and maize, beans, vegetables and potatoes (*irio*) are also common. Mashed plantain (*matoke*) is an alternative to maize. Other staples are cassava and sweet potatoes, and rice in urban areas. Milk and dairy products are an important part of the diet, in all parts of the country, but especially in pastoral communities. Both fresh and fermented milk are consumed.

Food security situation

Food security is defined as "A situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life" (FIVIMS). Food insecurity may be caused by the unavailability of food, insufficient purchasing power, inappropriate distribution, or inadequate use of food at the household level. Food insecurity may be chronic, seasonal or transitory.

Kenya is a low-income food-deficit country (WFP, 2005a). In 2004, it was estimated that more than 10 million Kenyans were experiencing chronic hunger, with only a small decline in absolute numbers over the ten-year period ending in 2002. This represents approximately a third of Kenya's total population. Food insecurity in Kenya is often seen as a problem of availability of food because of the poor performance of the agricultural sector, but problems of access to food also play an important role, because of inadequate market and transport infrastructure and low income and purchasing power due to poverty. Seasonal food insecurity affects households in rural areas before the start of the harvest. In addition to problems of chronic and seasonal food insecurity, Kenya is plagued by acute food insecurity primarily due to droughts and/or floods, which threaten lives and livelihoods of the most vulnerable groups of the population, particularly in the semi-arid and arid regions (EC & FIVIMS, 2004). An assessment conducted in July 2005 by the Government of Kenya and the World Food Programme indicated that there has been significant deterioration in household food security in most parts of north-eastern Kenya (Wajir, Garissa and Tana River districts) and in farming households in the south-eastern and coastal marginal districts (WFP, 2005b).

Agriculture which remains the backbone of the economy declined. As a sector that engages over 74% of the country's labour force, such a decline implies lower levels of income and more importantly, less food for the vast majority of Kenyans. Agricultural productivity is also affected negatively by fragmentation of land holdings (EC & FIVIMS, 2004).

Poor marketing and trade infrastructures adversely affect producers' access to both inputs and to markets for selling their products. The livestock sector is also affected by poor market infrastructure and inadequate quality control (EC & FIVIMS, 2004).

The food insecurity and vulnerability problems in the country are compounded by high levels of poverty. An estimated 17 million people (56% of the population), of whom three-quarters are found in rural areas, are living below the poverty line. The Kenyan economy has performed poorly during the last two decades. Consequently, per capita income has declined, and unemployment has risen (IMF, 2005).

In cities, the progression of the HIV/AIDS epidemic is also a major cause of poverty and food insecurity, killing active adults, devastating families and increasing the number of orphans.

II.2 National food supply data

Supply of major food groups

Table 11: Trends in per capita supply of major food groups (in g/day)

Major food groups	Supply for human consumption in g/day					
	1965-67	1972-74	1979-81	1986-88	1993-95	2000-2002
Cereals (excl. beer)	408	406	391	340	317	326
Fruit and vegetables	165	149	159	193	251	255
Milk and eggs	189	176	177	260	210	235
Starchy roots	214	209	187	161	155	152
Sweeteners	39	53	59	66	50	61
Pulses, nuts, oilcrops	64	59	31	24	23	48
Meat and offals	52	51	54	51	45	46
Other	125	122	91	73	48	43
Vegetable oils	4	5	13	13	19	20
Fish, seafood	8	7	9	16	16	14
Animal fats	1	2	2	1	1	2

Source: FAOSTAT

In terms of supply for human consumption, the three major food groups are cereals, fruit and vegetables and milk and eggs.

Overall, during the period 1965/67 to 2000/02, the supplies of cereals and starchy roots have declined while that of fruit and vegetables, milk and eggs, vegetable oils and sweeteners have increased.

The per capita supply of cereals fell from 408g/day in 1965/67 to 326g/day in 2000/02. A series of droughts occurred in 1993, 1996 and from mid-1999 to mid-2002 causing important shortcomings in cereal production. Maize and wheat are the main components of the supply of cereals. Maize is essentially locally produced while 70% of wheat was imported in 2002 (FAO, FAOSTAT Database). Maize production has decreased due to recurrent droughts. As a result, maize prices increased with severe consequences on household food security because this food is the main staple. The supply of starchy roots, mainly potatoes and cassava locally produced, decreased from 214g/per capita/day in 1965/67 to 152g/per capita/day in 2000/02.

The per capita supply of fruit and vegetables has steadily increased, from 165g/day to 255g/day in 1965/67 and 2000/02 respectively. The supply of fruit is principally composed of plantains, pineapples and bananas, which are locally produced (FAO, FAOSTAT Database).

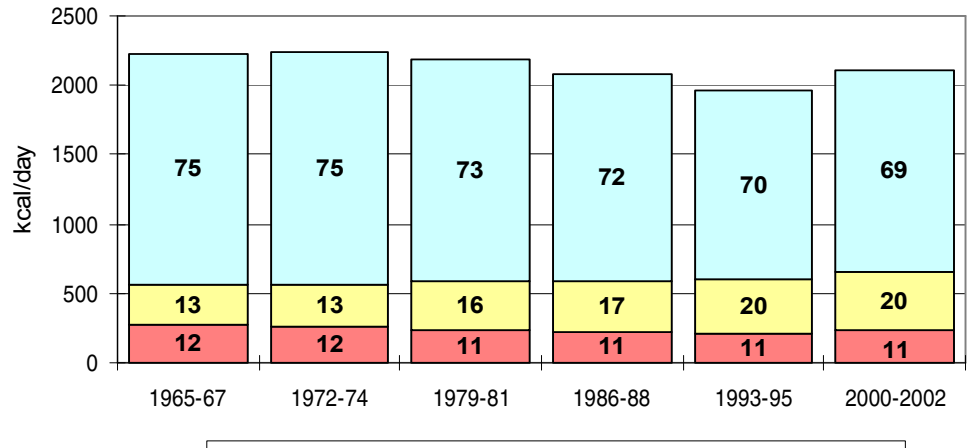
The supply of animal products has fluctuated. The per capita supply of milk and eggs slightly decreased in a first period from 1965/67 to 1979/81 and then increased considerably in 1986/88 (to 260g/day). During the following period, supply remained over 200g/per capita/day. The supply of meat and offals (principally bovine meat) slightly decreased from 52g/per capita/day in 1965/67 to 46g/per capita/day in 2000/02, while the supply of fish increased. Supply of animal fats remained stable.

The supply of vegetable oils (particularly refined palm oil) has increased five-fold between 1965/67 and 2000/02 and the supply of sweeteners increased by half during the same period (FAO, FAOSTAT Database). Trends in the supply of these two foods groups (vegetable oils and sweeteners) could be partially responsible for the emergent phenomenon of nutrition transition that affects certain population groups.

Dietary energy supply, distribution by macronutrient and diversity of the food supply

- Figure 1: Dietary energy supply (DES), trends and distribution by macronutrient

Figure 1: Trends in DES per capita and percentages from protein, lipids & carbohydrates



Kenya *Source: FAOSTAT*

In 2001, the dietary energy supply (DES) was 2 117 kcal/per capita/day, a level barely sufficient to satisfy population energy requirements of 2 095 kcal/per capita/day[1]. This implies that, due to inequality of distribution of the DES in the country, a large part of the population cannot satisfy their energy requirements. In 2000/02, according to *"The State of Food Insecurity in the World"* (SOFI), the prevalence of undernourishment was 33%, which represents a reduction by 11 percentage points over a decade (FAO, 2004b).

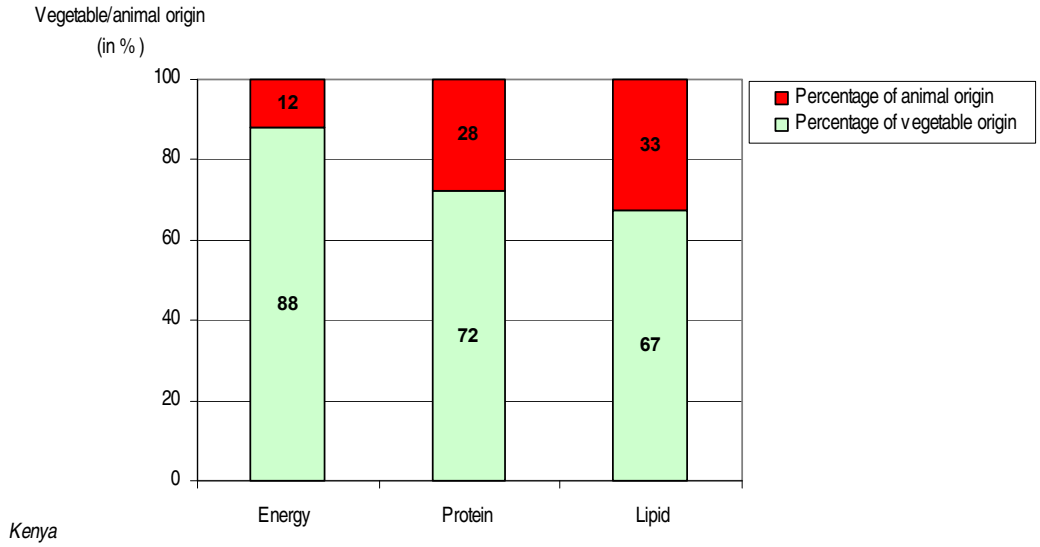
The current per capita DES has slightly increased after a long period of decline during the 1980s and 90s. The share of protein in the total DES remained stable (11-12%), while that of lipids increased from 13% to 20% during the period. The share of lipids is in line with recommendations (energy from lipids not exceeding 30%) (WHO, 2003).

[1] Energy requirements are for a healthy and active lifestyle calculated using the FAO software (FAO, 2004a). Software default values attribute to 90 % of the urban adult population a light physical activity level (PAL=1.55) and greater than light activity to the remaining 10% (PAL=1.85), and to 50% of the rural adult population a light activity (PAL=1.65) and greater than light physical activity (PAL=1.95) to the other 50%.

Vegetable/animal origin of macronutrients

- Figure 2: Vegetable/animal origin of energy, protein and lipid supplies

Figure 2: Origin of energy, protein and lipid supplies, 2000-2002



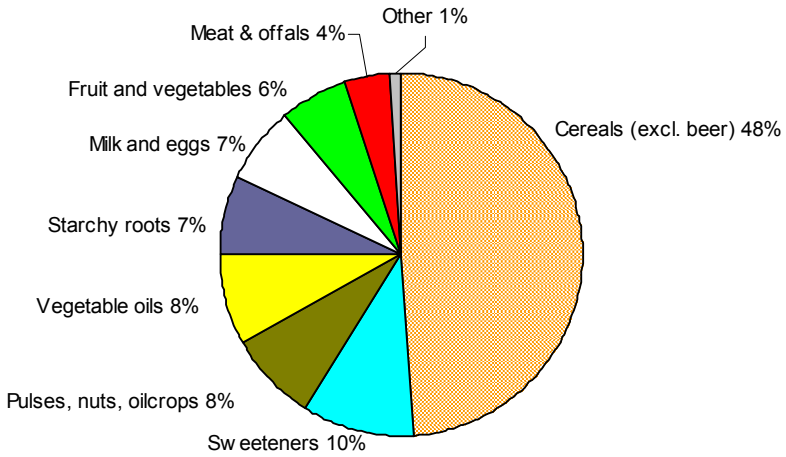
Kenya
Source: FAOSTAT

As a consequence of the high per capita supply of cereals, fruit and vegetables, pulses, vegetable oil and starchy roots, the share of macronutrient of vegetable origin is important. In 2000/02, 88% of energy was from vegetable foods. For protein and lipid supplies, 72% and 67% were of vegetable origin respectively. Limited supplies of animal products imply low intakes and low bioavailability of iron, vitamin A and calcium.

Dietary energy supply by food group

- Figure 3: Dietary energy supply by food group

Figure 3: Percentage of energy provided by major food group in 2000-2002



Kenya
Source: FAOSTAT
N.B. Values under 1% are not presented.

In 2000/02, cereals contributed 48% of the DES, followed by sweeteners (10%), and pulses, nuts and oilcrops (8%). Animal products (milk and eggs, meat and offals, fish and seafood) provided only 11% of the total DES. The Kenyan diet, essentially based on cereals, is typical of a poor country.

Table 12: Share of the main food groups in the Dietary Energy Supply (DES), trends

Food groups	% of DES					
	1965-67	1972-74	1979-81	1986-88	1993-95	2000-2002
Cereals (excl. beer)	57	57	56	51	50	48
Sweeteners	6	8	10	11	9	10
Vegetable oils	2	2	5	6	9	8
Pulses, nuts, oilcrops	9	8	5	4	4	8
Milk and eggs	5	5	5	8	7	7
Starchy roots	9	9	8	8	8	7
Fruit and vegetables	4	3	4	5	6	6
Meat and offals	4	4	4	4	4	4
Other	3	3	2	2	2	1
Animal fats	<1	<1	<1	<1	<1	<1
Fish, seafood	<1	<1	<1	<1	<1	<1

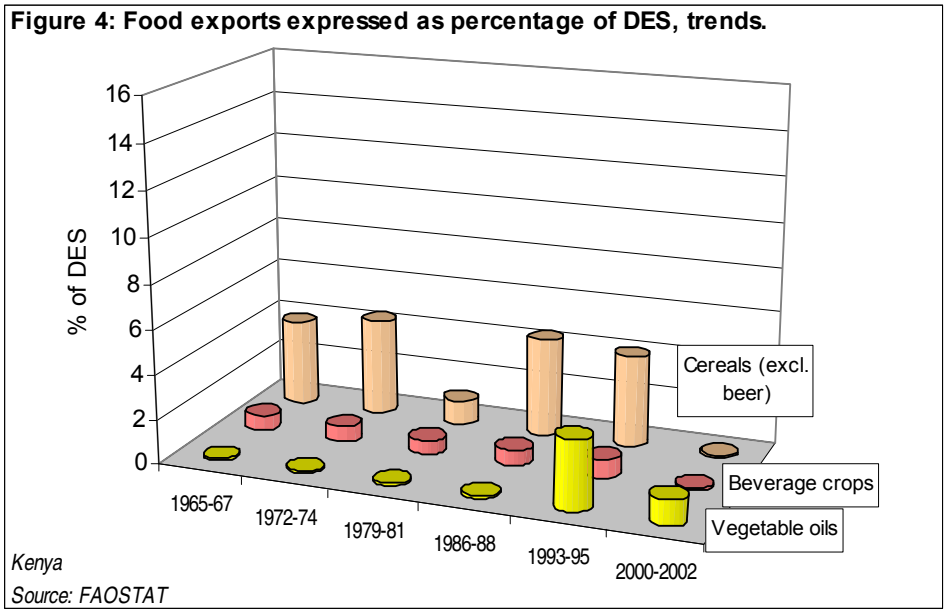
Source: FAOSTAT

Throughout the period from 1965/67 to 2000/02, cereals, sweeteners and starchy roots have been the main food groups contributing to the DES. The share of non-staple food groups is increasing, as revealed by a rise of the food diversification index. From 1965/67 to 2000/02, the index progressed from 34 to 45%. Consequently the diet is becoming more diverse and of better quality.

Food imports and exports expressed as percentage of DES

The level of exports of cereals, principally maize, fluctuated from 1965/67 to 2000/02. In the last period it was low because of severe drought in 2000. Vegetable oils (soybean oil) and beverage crops (tea, coffee) constitute the two other main exports.

- Figure 4: Major food exports as percentage of Dietary Energy Supply (DES), trends

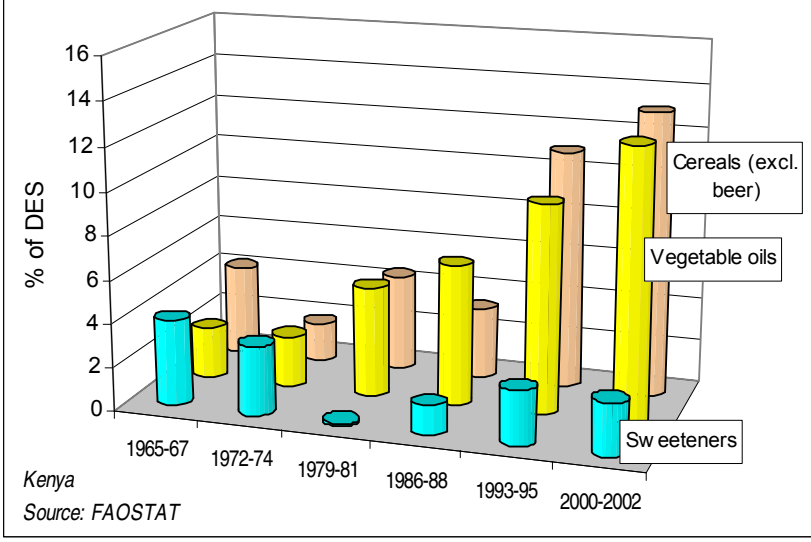


Note that only the 3 most important food groups are shown.

Kenya is dependant on food imports, principally of cereals (wheat and rice) which represented 13% of the DES in 2000/02. Since 1979/81, the imports of vegetable oils have steadily increased. The country exports some soybean oil and imports large quantities of palm oil. The import of sweeteners represented about 2% of the DES in 2000/02.

- Figure 5: Major food imports as percentage of Dietary Energy Supply (DES), trends

Figure 5: Food imports expressed as percentage of DES, trends.



Note that only the 3 most important food groups are shown.

Food aid

In 2004, Kenya received a total food aid of 202 659 t, of which 174 239 t of cereals (mainly coarse grains [59%], wheat [27%], blended/fortified commodities [13%] and rice [1%]) and 28 420 t of non-cereals (mainly oils and fats [65%], pulses [32%] and other non-cereal commodities [3%]). This food aid was mainly delivered as emergency food aid (61%) and project food aid (39%). No programme food aid was delivered[2] (WFP, 2005c).

In 2004/05, the main beneficiaries of WFP's food aid interventions in Kenya were drought-affected populations of arid and semi-arid areas (WFP, 2004). About a quarter of food aid beneficiaries were Sudanese and Somali refugees living in Kakuma and Dadaab camps in the north-east and central-west parts of the country. WFP interventions included general distribution, supplementary feeding, food-for-work and school-feeding projects (WFP, 2005d and 2005b).

II.3 Food consumption

National level surveys

Presently, no data are available on food consumption.

[2] *Emergency* food aid is destined to victims of natural or man-made disasters; *Project* food aid aims at supporting specific poverty-alleviation and disaster-prevention activities; *Programme* food aid is usually supplied as a resource transfer for balance of payments or budgetary support activities. Unlike most of the food aid provided for project or emergency purposes, it is not targeted to specific beneficiary groups. It is sold on the open market, and provided either as a grant, or as a loan.

II.4 Infant and young child feeding practices

Breastfeeding is a common practice in Kenya, as the large majority (97%) of children under 5 years were breastfed. This proportion has not varied between 1993 and 1998 (CBS, NCPD, & Macro Int., 1999; CBS, MOH & ORC Macro, 2004). Breastfeeding is equally widespread in urban and rural areas but was less common in the North Eastern province (89%).

Early initiation of breastfeeding is also largely practiced; more than half of neonates were breastfed within one hour of birth and 82% within one day after delivery (CBS, MOH & ORC Macro, 2004). Duration of breastfeeding does not vary by urban/rural sector, and education only has a modest influence, uneducated mothers breastfeeding for about 4 months more than educated mothers (CBS, MOH & ORC Macro, 2004).

Table 13: Initiation and duration of breastfeeding

Survey name/date (Reference)	Background characteristics	Sample size (all children under five years)	Percentage of children under five years ever breastfed	Number of children under five years ever breastfed	Among children ever breastfed, percentage breastfed within one hour of birth	Among children ever breastfed, percentage breastfed within 24 hours of birth[1]	Number of children under three years	Median duration of breastfeeding in children under three years (in months)
Kenya Demographic and Health Survey 2003 (CBS, MOH & ORC Macro, 2004)	**Total**	6 102	96.8	5 906	52.3	81.7	3 702	20.1
	Sex							
	M	3 110	96.2	2 993	50.5	80.7	1 882	19.1
	F	2 992	97.4	2 913	54.1	82.8	1 821	21.0
	Residence							
	urban	1 143	96.5	1 103	51.2	80.0	698	19.0
	rural	4 959	96.9	4 803	52.5	82.1	3 004	20.4
	Province							
	Nairobi	398	96.2	383	55.1	82.3	242	16.7
	Central	652	98.2	641	61.8	86.4	381	19.0
	Coast	510	95.0	484	22.4	69.0	318	21.5
	Eastern	946	96.8	916	66.6	92.3	570	24.7
	Nyanza	1 000	97.9	980	46.2	77.5	619	18.2
	Rift Valley	1 639	96.8	1 587	62.4	84.0	1 008	19.4
	Western	776	97.3	755	30.7	76.5	459	18.9
	North Eastern	181	88.9	160	54.9	68.3	106	12.8
	Mother's education							
	no education	938	94.9	890	56.7	80.5	565	23.8
	primary	3 900	97.3	3 795	50.8	82.0	2 384	19.8
	secondary or higher	1 263	96.6	1 221	53.7	81.9	753	19.4

[1] Includes children who started breastfeeding within one hour of birth.

Infant and young child feeding practices are rather favourable to health and growth. However, there are still some inadequate practices particularly regarding exclusive breastfeeding and bottle-feeding. Only 29% of children under 2 months of age were exclusively breastfed. After 2 months, the percentage decreased sharply and overall only 13% of children under 6 months were exclusively breastfed. Bottle-feeding is a rather common practice in Kenya, concerning more than one-quarter of children under 1 year (CBS, MOH & ORC Macro, 2004). Bottle-feeding may result in increased morbidity due to unsafe preparation techniques and because a large proportion of the population do not have access to improved water sources (UNICEF, 2005).

The timing of the introduction of complementary feeding is generally adequate (CBS, MOH & ORC Macro, 2004). Young children receive a variety of complementary foods, including fruit and vegetables and animal foods but the amounts given are not documented.

Table 14: Type of infant and young child feeding

Survey name/date (Reference)	Type of feeding in the 24 hours preceding the survey		
	Indicator by age	Sample size	Percentage of children
Kenya Demographic and Health Survey 2003 (CBS, MOH & ORC Macro, 2004)	**Exclusive breastfeeding rate**		
	0-1 month	171	29.3
	2-3 months	232	9.3
	4-5 months	204	2.6
	<4 months	403	17.8
	<6 months	607	12.7
	Timely complementary feeding rate		
	6-9 months	403	84.2
	Bottle-feeding rate		
	0-11 months	1 250	27.6
	Continued breastfeeding rate		
	12-15 months (1 year)	394	92.1
	20-23 months (2 years)	307	57.3

Table 15: Consumption of complementary foods, and meal frequency by breastfeeding status and age

Survey name/date (Reference)	Age (months)	Breastfeeding status	Number of children	Foods consumed by children in the 24 hours preceding the survey						Mean number of meals per day
				Percent of children having consumed the following foods						
				Infant formula	Other milk and dairy products	Pulses	Meat/ fish/ eggs	Foods with oil/ fat/butter	Fruit and vegetables rich in vit. A	
Kenya Demographic and Health Survey 2003 (CBS, MOH & ORC Macro, 2004)	**6-11**	breastfed children	602	5.9	60.8	21.0	19.6	n.a.	57.4	2.5
	12-23	breastfed children	789	3.6	60.7	33.7	27.6	n.a.	76.7	2.9
	24-35	breastfed and non breastfed children	676	3.6	61.9	37.7	35.3	n.a.	83.7	3.1

n.a.: not available

The Baby Friendly Hospital Initiative is well implemented in the country and contributes to improving breastfeeding practices. In 2002, 232 of the 350 hospitals and maternities were officially designated by UNICEF as Baby Friendly (UNICEF, 2002).

II.5 Nutritional anthropometry

Low birth weight

In 1998, the prevalence of low birth weight (less than 2 500g) was of 11%, but only 46% of neonates had been weighed (UNICEF & WHO, 2004; UNICEF, Information by country). Thus the representativeness of the indicator is limited. The high prevalence of low birth weight could be related to the prevalence of chronic energy deficiency among mothers (12%) (CBS, MOH & ORC Macro, 2004).

Anthropometry of preschool children

Three national surveys, conducted in 1998, 2000 and 2003 document the nutritional status of preschool children (CBS, NCDP & Macro Int., 1999; CBS & MFP, 2002; CBS, MOH & ORC Macro, 2004).

In 2003, 20% of children under 5 years were underweight and the prevalence of severe underweight was 4%.

Almost a third of children were stunted, and 11% were severely stunted. The prevalence of stunting was higher among male children then among females, and higher in rural compared to urban areas. The Eastern and Coast provinces had the highest prevalence of stunting. The prevalence in the arid and poor North-Eastern province is lower than expected but this could be due to the small size of the sample or problems with measurements. Prevalence of stunting was much lower among mothers with secondary and higher education (CBS, MOH & ORC Macro, 2004).

The survey was conducted during the period of food shortage. Wasting affected 6% of preschool children and 1% were severely wasted. Prevalence was highest in the 12-23 months age group, when contaminated complementary foods are introduced and are likely to cause diarrhea. The prevalence of wasting among children in the North-Eastern province was extraordinarily high (27%) and prevalence of severe wasting was very high (11%) (CBS, MOH and ORC Macro, 2004). These levels of wasting in underfives indicate a major food crisis. This province is often affected by food deficits. In 2003, harvests were delayed in many regions, including the North-Eastern province, and the maize supply did not meet consumption needs during the critical July-September period (FEWS, 2003). The data from this province must nevertheless be interpreted with caution because of the small size of the sample and possible problems of validity as stunting prevalence was simultaneously unexpectedly low.

Overall a small proportion of underfives were overweight. Although the figures are low, prevalence in the urban sector is twice that found in rural areas suggesting that overnutrition of young children could be an emerging phenomenon in urban Kenya (CBS, MOH and ORC Macro, 2004).

Analysis of trends across the three surveys shows that prevalence of underweight and stunting did not decrease substantially between 1998 and 2003. Moreover, the prevalence of wasting remained the same (CBS, NCDP & Macro Int., 1999; CBS, MOH & ORC Macro, 2004). These results show that there has been no progress in the nutrition situation of infants and young children in the last 5 years, which reflects unfavourable trends in several sectors, e.g. stagnation of the economy and of the food security situation, persistent lack of access to health care and affordable drugs, and the progression of the HIV/AIDS epidemic.

Table 16: Anthropometry of preschool children

Name/date of survey (month/year) (Reference)	Background characteristics	Age (years)	Sex	Sample size	Prevalence of malnutrition						
					Percentage of children with						
					Stunting Height-for-age		Wasting Weight-for-height		Underweight Weight-for-age		Overweight [1] Weight-for-height
					< -3 Z-scores	< -2 Z-scores*	< -3 Z-scores	< -2 Z-scores*	< -3 Z-scores	< -2 Z-scores*	> +2 Z-scores
Kenya Demographic and Health Survey 2003 (Apr-Sep. 2003) (CBS, MOH & ORC Macro, 2004)	**Total**	0-4.99	M/F	5 307	11.0	30.3	1.2	5.6	4.1	19.9	3.7
	Sex										
		0-4.99	M	2 663	11.6	32.9	1.3	6.4	4.6	22.0	3.3
		0-4.99	F	2 643	10.4	27.7	1.2	4.8	3.6	17.7	4.2
	Age										
		0-0.49	M/F	511	0.9	7.4	0.6	3.9	0.0	2.4	13.7
		0.5-0.99	M/F	610	3.8	15.3	1.4	6.0	2.6	15.1	6.2
		1-1.99	M/F	1 086	15.9	43.1	2.3	9.5	7.8	26.8	3.6
		2-2.99	M/F	1 005	13.6	35.5	1.4	5.5	5.2	25.3	2.0
		3-3.99	M/F	1 100	13.3	34.1	0.8	4.3	3.2	20.8	1.5
		4-4.99	M/F	995	10.1	27.9	0.5	3.4	2.9	17.8	1.5
	Residence										
	urban	0-4.99	M/F	882	9.3	23.6	1.0	4.2	2.8	12.6	6.2
	rural	0-4.99	M/F	4 425	11.3	31.7	1.3	5.8	4.4	21.3	3.2
	Province										
	Nairobi	0-4.99	M/F	304	5.3	18.7	1.2	4.5	1.9	6.3	8.9
	Central	0-4.99	M/F	571	8.7	27.0	1.1	4.4	2.2	14.6	4.9
	Coast	0-4.99	M/F	426	13.9	34.9	0.0	5.7	5.9	25.4	2.6
	Eastern	0-4.99	M/F	888	12.9	32.5	0.9	4.2	4.2	21.4	3.3
	Nyanza	0-4.99	M/F	826	7.9	31.1	0.1	2.3	2.4	15.6	2.8
	Rift Valley	0-4.99	M/F	1 427	12.3	31.6	1.6	7.7	5.2	24.0	4.1
	Western	0-4.99	M/F	739	11.8	30.2	1.2	4.5	4.2	19.0	2.3
	North Eastern	0-4.99	M/F	127	12.3	24.3	10.9	26.5	9.9	33.7	2.4
	Mother's education										
	no education	0-4.99	M/F	731	16.3	36.4	3.5	14.8	9.9	33.1	n.a.
	primary	0-4.99	M/F	3 225	11.4	33.0	0.9	4.1	3.5	19.9	n.a.
	secondary or higher	0-4.99	M/F	1 069	5.2	19.2	0.5	3.6	1.7	10.6	n.a.

* Category <-2 Z-scores includes <-3 Z-scores.

[1] Data on overweight taken from WHO Global Database on Child Growth and Malnutrition.

n.a.: not available.

Table 16: Anthropometry of preschool children (cont.)

Name/date of survey (month/year) (Reference)	Background characteristics	Age (years)	Sex	Sample size	Prevalence of malnutrition						
					Percentage of children with						
					Stunting Height-for-age		Wasting Weight-for-height		Underweight Weight-for-age		Overweight [1] Weight-for-height
					< -3 Z-scores	< -2 Z-scores*	< -3 Z-scores	< -2 Z-scores*	< -3 Z-scores	< -2 Z-scores*	> +2 Z-scores
Kenya Multiple Indicator Cluster Survey 2000 (MICS) (Sep-Oct. 2000) (CBS & MFP, 2002)	**Total**	0-4.99	M/F	5 917	14.7	35.3	1.4	6.0	5.7	21.2	4.5
	Sex										
		0-4.99	M	3 000	15.7	37.9	1.8	6.6	6.7	22.6	3.8
		0-4.99	F	2 917	13.7	32.6	0.9	5.3	4.6	19.6	5.3
	Age										
		0-0.49	M/F	322	1.4	12.4	0.8	2.4	0.5	3.0	16.2
		0.5-0.99	M/F	598	6.2	24.5	0.6	3.9	4.2	14.6	11.0
		1-1.99	M/F	1 312	21.3	47.5	2.5	9.9	9.2	28.4	5.5
		2-2.99	M/F	1 290	13.5	34.8	1.4	6.6	6.6	22.5	2.2
		3-3.99	M/F	1 286	15.3	34.5	1.0	4.1	3.8	19.4	2.3
		4-4.99	M/F	1 109	16.1	34.7	0.9	4.9	4.9	21.9	1.9
	Residence										
	urban	0-4.99	M/F	1 420	10.4	26.6	0.8	3.3	2.1	12.4	5.1
	rural	0-4.99	M/F	4 497	16.0	38.0	1.5	6.8	6.8	23.9	4.4
	Province										
	Nairobi	0-4.99	M/F	760	11.1	29.6	0.8	3.1	1.8	12.4	5.5
	Central	0-4.99	M/F	627	9.6	27.4	1.1	4.6	3.3	15.4	6.1
	Coast	0-4.99	M/F	566	15.5	33.7	1.5	6.4	4.0	21.1	1.8
	Nyanza	0-4.99	M/F	959	16.3	35.4	1.7	5.2	6.2	19.9	5.1
	Rift Valley	0-4.99	M/F	1 533	14.9	36.8	1.5	7.6	7.3	24.9	4.1
	Western	0-4.99	M/F	734	16.9	38.1	1.4	5.5	8.0	21.5	5.2
	North Eastern	0-4.99	M/F	65	17.0	35.4	0.0	7.2	3.7	16.6	9.2
	Mother's education										
	no education	0-4.99	M/F	1 347	17.2	37.2	1.6	7.1	7.2	24.1	n.a.
	primary	0-4.99	M/F	3 147	16.3	38.8	1.7	6.6	6.8	23.3	n.a.
	secondary or higher	0-4.99	M/F	1 423	8.9	25.6	0.5	3.4	1.8	13.7	n.a.

* Category <-2 Z-scores includes <-3 Z-scores.

[1] Data on overweight taken from WHO Global Database on Child Growth and Malnutrition.

n.a.: not available.

Table 16: Anthropometry of preschool children (cont.)

Name/date of survey (month/year) (Reference)	Background characteristics	Age (years)	Sex	Sample size	Prevalence of malnutrition						
					Percentage of children with						
					Stunting Height-for-age		Wasting Weight-for-height		Underweight Weight-for-age		Overweight Weight-for-height
					< -3 Z-scores	< -2 Z-scores*	< -3 Z-scores	< -2 Z-scores*	< -3 Z-scores	< -2 Z-scores*	> +2 Z-scores
Kenya Demographic and Health Survey 1998 (Feb-Jul. 1998) (CBS, NCDP & Macro Int. Inc.,1999)	**Total**	0-4.99	M/F	4 413	12.7	33.0	1.4	6.1	4.8	22.1	n.a.
	Sex										
		0-4.99	M	2 246	13.2	35.2	1.5	5.9	4.6	22.2	"
		0-4.99	F	2 167	12.1	30.8	1.4	6.2	5.0	22.0	"
	Age										
		<0.49	M/F	427	0.8	7.1	1.3	5.2	0.4	2.3	"
		0.5-0.99	M/F	506	4.8	17.5	2.5	7.8	4.6	14.8	"
		1-1.99	M/F	979	17.5	41.8	1.6	9.1	7.2	26.9	"
		2-2.99	M/F	909	13.4	37.8	0.9	4.9	6.3	28.3	"
		3-3.99	M/F	811	15.3	35.6	1.8	4.9	3.3	23.8	"
		4-4.99	M/F	781	14.7	38.0	0.8	4.0	4.0	22.7	"
	Residence										
	urban	0-4.99	M/F	751	7.4	24.7	2.0	5.1	2.3	13.3	"
	rural	0-4.99	M/F	3 662	13.8	34.7	1.3	6.2	5.3	23.9	"
	Province										
	Nairobi	0-4.99	M/F	257	7.1	25.7	3.6	7.1	2.1	11.4	"
	Central	0-4.99	M/F	414	9.8	27.5	1.7	5.6	2.0	14.3	"
	Coast	0-4.99	M/F	346	18.3	39.1	1.0	4.3	7.1	27.4	"
	Eastern	0-4.99	M/F	753	13.2	36.8	0.9	4.7	6.6	25.7	"
	Nyanza	0-4.99	M/F	906	11.2	30.8	1.2	7.0	5.8	22.2	"
	Rift Valley	0-4.99	M/F	1 134	13.3	33.1	1.8	7.4	4.2	24.9	"
	Western	0-4.99	M/F	604	14.3	35.0	0.9	4.6	3.6	19.1	"
	Mother's education										
	no education	0-4.99	M/F	487	21.4	46.4	1.2	8.8	8.8	36.8	"
	primary	0-4.99	M/F	2 775	14.3	36.4	1.6	6.5	5.3	24.1	"
	secondary or higher	0-4.99	M/F	1 152	5.0	19.2	1.0	3.9	1.7	11.0	"

* Category <-2 Z-scores includes <-3 Z-scores.

n.a.: not available.

Anthropometry of school-age children and adolescents

No data are currently available on anthropometry of school-age children and adolescents.

Anthropometry of adult women

In 2003, only 1% of adult women were stunted (height <1.45m), but more than one out of ten (12%) had a body mass index <18.5kg/m², defining chronic energy deficiency (CED). Prevalence of CED was highest among young women aged 15-19 years, reaching 20%. Women living in rural areas were much more likely to have CED than urban women (15% and 5% respectively). Food deficits are common in the North-Eastern province and this affected the nutritional status of women living in this area. There is an inverse relationship between educational level and CED: only 6% of women with secondary or higher education level were affected (CBS, MOH & ORC Macro, 2004).

Between 1998 and 2003, no drop in malnutrition among women was observed (NCPD, CBS & Macro Int, 1999; CBS, MOH and ORC Macro, 2004). In comparison with data from 1993, the nutritional status of women worsened slightly, with prevalence increasing from 9% to 12% according the most recent survey (CBS, MOH & ORC Macro, 2004).

In 2003, almost one-quarter of women were overweight or obese. A positive trend was observed with advancing age. Prevalence of overweight and obesity were much higher in the urban sector (38% vs only 18% in the rural sector) (CBS, MOH & ORC Macro, 2004). Estimates taken from the SuRF report are similar (WHO, 2005). The representativeness of the data is however not documented. The data suggest that the urban population of Kenya is starting to be affected by the nutrition transition.

Table 17: Anthropometry of adult women

Name/date of survey (month/year) (Reference)	Background characteristics	Age (years)	Anthropometry of adult women								
			Height			Body Mass Index[1] (BMI) (kg/m²)					
								Percentage of women with BMI			
			Sample size	Mean (m)	% of women with height < 1.45 m	Sample size	Mean (kg/m²)	<18.5 (chronic energy deficiency)	18.5-24.9 (normal)	25.0-29.9 (overweight)	≥30.0 (obesity)
Kenya Demographic and Health Survey 2003 (Apr-Sep. 2003) (CBS, MOH & ORC Macro, 2004)	**Total**	15-49	7 739	1.59	1.1	7 047	22.7	12.3	64.3	17.1	6.3
	Age										
		15-19	1 746	1.58	2.0	1 612	20.9	20.4	71.7	7.5	0.4
		20-24	1 605	1.60	1.0	1 378	22.2	9.3	73.7	14.6	2.4
		25-29	1 289	1.60	0.4	1 128	22.4	11.0	68.9	15.4	4.8
		30-34	1 033	1.60	0.9	934	23.5	9.6	59.2	22.7	8.6
		35-39	828	1.60	0.5	783	24.1	9.8	53.4	24.2	12.6
		40-44	749	1.60	1.0	725	24.2	10.9	50.2	24.2	14.7
		45-49	488	1.59	1.0	487	24.4	8.3	51.0	26.8	13.9
	Residence										
	urban	15-49	1 899	1.60	0.8	1 759	24.5	5.4	55.9	26.4	12.3
	rural	15-49	5 840	1.59	1.1	5 288	22.1	14.6	67.1	14.0	4.4
	Province										
	Nairobi	15-49	786	1.60	0.7	721	24.6	4.5	56.4	26.9	12.2
	Central	15-49	1 120	1.59	1.5	1 046	23.8	7.1	59.1	24.3	9.5
	Coast	15-49	634	1.57	2.5	567	23.0	13.3	60.2	16.6	9.9
	Eastern	15-49	1 249	1.57	1.8	1 160	22.2	13.0	68.4	14.3	4.3
	Nyanza	15-49	1 178	1.61	0.7	1 050	22.1	10.6	72.8	12.8	3.8
	Rift Valley	15-49	1 722	1.60	0.4	1 579	22.1	18.6	60.4	15.6	5.5
	Western	15-49	902	1.61	0.3	798	22.1	11.9	71.6	13.2	3.2
	North Eastern	15-49	148	1.61	2.0	125	19.9	27.5	65.0	7.1	0.4
	Education's level										
	no education	15-49	969	1.59	1.1	858	21.2	24.5	60.6	10.6	4.4
	primary	15-49	4 497	1.59	1.4	4 046	22.2	13.2	67.3	15.0	4.4
	secondary or higher	15-49	2 274	1.60	0.5	2 142	24.1	5.7	60.1	23.5	10.7

[1] excludes pregnant women and women with a birth in the 2 preceding months.

Table 17: Anthropometry of adult women (cont.)

Name/date of survey (month/year) (Reference)	Background characteristics	Age (years)	Anthropometry of adult women					
			Height			Body Mass Index[1] (BMI) (kg/m²)		
			Sample size	Mean (m)	% of women with height < 1.45 m	Sample size	Mean (kg/m²)	Percentage of women with BMI <18.5 (chronic energy deficiency)
Kenya Demographic and Health Survey 1998 (Feb-Jul. 1998) (CBS, NCDP & Macro Int. Inc.,1999)	**Total**	15-49	3 656	1.60	1.1	3 106	21.9	11.9
	Age							
		15-19	307	1.59	2.0	244	21.1	17.4
		20-24	1 001	1.60	0.7	820	21.5	10.5
		25-29	1 004	1.60	1.4	854	22.0	11.7
		30-34	633	1.61	0.6	547	22.4	12.1
		35-49	710	1.60	1.3	641	22.2	11.6
	Residence							
	urban	15-49	699	1.60	0.9	627	23.3	7.5
	rural	15-49	2 957	1.60	1.1	2 479	21.6	13.0
	Province							
	Nairobi	15-49	257	1.60	1.4	233	23.5	4.7
	Central	15-49	372	1.59	0.9	326	22.6	8.6
	Coast	15-49	289	1.58	2.4	249	21.8	14.9
	Eastern	15-49	617	1.58	2.1	527	21.3	15.4
	Nyanza	15-49	790	1.61	1.1	666	21.5	11.3
	Rift Valley	15-49	879	1.61	0.3	740	21.9	15.5
	Western	15-49	451	1.61	0.4	365	22.1	5.8
	Education's level							
	no education	15-49	397	1.58	2.2	352	21.2	18.9
	primary	15-49	2 279	1.60	1.2	1 897	21.5	13.0
	secondary or higher	15-49	980	1.61	0.4	858	23.1	6.4

[1] excludes pregnant women and women with a birth in the 2 preceding months.

Note: The sample represents women who had a birth in the five years preceding the survey. Data for overweight and obesity are not available.

Anthropometry of adult men

In 2002, the mean BMI among men aged 15 years and above was only 20.5kg/m². Only 6.5% and 0.1% of them were overweight and obese respectively (WHO, 2005). The representativeness of the data is however not documented. No data on chronic energy deficiency among men are currently available. However, the low mean BMI can suggest that an important proportion of adult men are in chronic energy deficiency.

II.6 Micronutrient deficiencies

Iodine deficiency disorders (IDD)

Prevalence of goitre and urinary iodine level

The only data available refers to the report of the National Micronutrient Survey conducted in 1994. At that time, 16% of children 8-10 years had goitre. The median level of urinary iodine was 115µg/L (Gitau, 1995). IDD seems to be an important health problem in Kenya and recent and representative studies are necessary to assess this issue.

Causes of iodine deficiency include low-level consumption of iodine rich foods and presence of goitrogens in the diet.

Table 18: Prevalence of goitre and level of urinary iodine in school-age children

Survey name/date (Reference)	Background characteristics	Age (years)	Sex	Prevalence of goitre		Level of urinary iodine		
				Sample size	Percentage with goitre [Total Goitre]	Sample size	Median (µg/L)	Percentage with urinary iodine <100µg/L
Report of the National Micronutrient Survey- February to August 1994 (Gitau, 1995)[1]	**Total**	8-10	M/F	20 916	15.5	3 042	115	n.a.
	Sex							
		8-10	M	10 504	14.6	n.a.	n.a.	"
		8-10	F	10 358	16.5	"	"	"

[1] Data taken from WHO Global Database on Iodine Deficiency. Data by districts (n=45) are given in the database.

n.a.: not available.

Iodization of salt at household level

In 2000, 91% of the households where salt was available for testing used adequately iodized salt (≥15ppm). In rural areas, percent of households with iodized salt was somewhat higher than in urban areas. In all regions, the proportion of households using adequately iodized salt was over 80% (CBS & MFP, 2002).

IDD legislation was passed in Kenya in 1978 and revised in 1988. In 1987, a National Council for the Control of Iodine Deficiency Disorders was established to create a proposal to prevent IDD. The country is an important producer of iodized salt for the region. Most of the iodized salt is processed in Malindi and Mombasa (ICCIDD, 2002).

Major needs include better quality control of iodized salt, greater availability of data on urinary iodine and participation in regional discussions about harmonization of salt iodine levels. The current iodization level, 100 ppm as iodine, is one of the highest in the world, and concern exists about it being excessive (ICCIDD, 2002).

Table 19: Iodization of salt at household level

Survey name/date (Reference)	Background characteristics	Number of persons in households where salt was available for testing	Iodine level of household salt		Percentage of households tested
			Inadequate (<15 ppm)	Adequate (≥15 ppm)	
Kenya Multiple Indicator Cluster Survey 2000 (MICS) (CBS & MFP, 2002)	**Total**	45 159	9.3	90.7	96.7
	Residence				
	urban	9 983	11.9	88.1	95.7
	rural	35 175	8.5	91.5	97.0
	Province				
	Nairobi	5 691	15.8	84.2	95.0
	Central	5 541	17.7	82.3	97.6
	Coast	3 936	5.9	94.1	98.0
	Eastern	7 133	11.4	88.6	97.2
	Nyanza	7 344	7.3	92.7	97.1
	Rift Valley	9 898	3.2	96.8	96.8
	Western	5 222	3.9	96.1	96.3
	North Eastern	395	14.5	85.5	85.8

Note: ppm: parts per million

Vitamin A deficiency (VAD)

Prevalence of sub-clinical and clinical vitamin A deficiency

The country exhibits an alarmingly high prevalence of vitamin A deficiency. In 1999, at the national level, 84% of children under 6 years had low serum retinol (<20µg/dL), indicating sub-clinical vitamin A deficiency. Children of Coastal region were the most affected (GOK & UNICEF, 2002). More recent data are not available.

Table 20: Prevalence of sub-clinical vitamin A deficiency in children under 6 years

Survey name/date (Reference)	Background characteristics	Age (years)	Sex	Prevalence of low level of serum retinol	
				Sample size	Percentage with serum retinol <20 µg/dL or 0.70 µmol/L
Anaemia and the Status of Iron, Vitamin A and Zinc in Kenya, 1999 (GOK & UNICEF, 2002)	**Total**	<5.99	M/F	955	84.4
	Region				
	Lake Basin	<5.99	M/F	208	88.5
	Western Highlands	<5.99	M/F	305	88.8
	Central Highlands	<5.99	M/F	213	69.4
	Dry, humid & semi arid areas	<5.99	M/F	133	88.9
	Coastal region	<5.99	M/F	96	94.4

In 2000, among mothers aged from 15 to 49 years, 12% experienced night blindness during their last pregnancy. Prevalence varied moderately by region (CBS & MFP, 2002). Data from a local study conducted in Nandi district showed that 78% of breastfeeding mothers had a low level of retinol in breastmilk (<1.05 µmol/L) (Ettyang et al, 2003).

Table 21: Prevalence of clinical and sub-clinical vitamin A deficiency in mothers during their last pregnancy and during lactation

Survey name/date (Reference)	Background characteristics	Age (years)	Prevalence of night blindness during pregnancy[1]			Prevalence of low level of retinol in breastmilk	
			Number of mothers	Percentage (non adjusted)	Percentage adjusted for daytime blindness	Number of breastfeeding mothers	Percentage with retinol in breastmilk ≤1.05 µmol/L
Kenya Multiple Indicator Cluster Survey 2000 (MICS) 2000 (CBS & MFP, 2002)	**Total**	15-49	1 622	11.6	n.a.	n.a.	n.a.
	Residence						
	urban	15-49	307	11.1	"	"	"
	rural	15-49	1 315	11.7	"	"	"
	Province						
	Nairobi	15-49	90	10.0	"	"	"
	Central	15-49	162	6.2	"	"	"
	Coast	15-49	198	12.6	"	"	"
	Eastern	15-49	177	10.7	"	"	"
	Nyanza	15-49	320	14.4	"	"	"
	Rift Valley	15-49	496	10.9	"	"	"
	Western	15-49	176	14.2	"	"	"
Serum retinol, iron status and body composition of lactating women in Nandi, Kenya, Dec. 1998 - Jan. 1999 (Ettyang et al, 2003)	**Region**						
	Nandi district	n.a.	n.a.	n.a.	n.a.	88	78.1

[1] During the last pregnancy of women with a live birth in the 5 years preceding the survey.
n.a.: not available.

Vitamin A deficiency is a major public health problem in Kenya. More information is needed on the exact causes of the deficiency, since carotenoids and vitamin A are abundant in the diet. Interactions with undernutrition are likely.

Vitamin A supplementation

In 2003, one-third of underfives received vitamin A supplements. Intake of supplements varied by background characteristics. Male children were slightly more likely than female children to have received vitamin A supplements and children living in urban areas received more supplements than children living in rural areas. In Eastern and Northern provinces where vitamin A deficiency is highly prevalent, supplementation reached less than one quarter of children (CBS, MOH & ORC Macro, 2004).

Among mothers, only 14% received vitamin A supplements within 2 months postpartum. Supplementation was more frequent in urban areas. In the Central and Western provinces supplementation reached only 11% and 12% of mothers, respectively (CBS, MOH & ORC Macro, 2004).

Table 22: Vitamin A supplementation of children and mothers

Survey name/date (Reference)	Background characteristics	Children				Mothers		
		Age (months)	Sex	Number of children	Percent of children who received vit. A supplements in the 6 months preceding the survey	Age (years)	Number of mothers[1]	Percent of mothers who received vit. A supplements within 2 months postpartum
Kenya Demographic and Health Survey 2003 (CBS, MOH & ORC Macro, 2004)	**Total**	6-59	M/F	4 941	33.3	15-49	4 052	14.2
	Sex							
		6-59	M	2 493	35.3			
		6-59	F	2 447	31.4			
	Residence							
	urban	6-59	M/F	945	40.4	15-49	835	19.9
	rural	6-59	M/F	3 996	31.7	15-49	3 217	12.7
	Province							
	Nairobi	6-59	M/F	326	37.5	15-49	307	20.3
	Central	6-59	M/F	557	35.0	15-49	495	10.7
	Coast	6-59	M/F	416	33.2	15-49	336	22.9
	Eastern	6-59	M/F	786	22.4	15-49	646	12.2
	Nyanza	6-59	M/F	720	26.5	15-49	643	13.7
	Rift Valley	6-59	M/F	1 372	36.5	15-49	1 052	13.6
	Western	6-59	M/F	617	46.8	15-49	470	11.9
	North Eastern	6-59	M/F	146	24.6	15-49	102	15.6

[1] Women with a birth in the 5 years preceding the survey. For women with two or more births during that period, data refer to the most recent birth.

Iron deficiency anemia (IDA)

Prevalence of IDA

IDA is an important health problem in Kenya. According to the survey conducted by the government and UNICEF in 1999, 89% of children under 6 years were anemic. Prevalence was as high as 91% in the Lake Basin region (GOK & UNICEF, 2002).

Among women of childbearing age, 56% were anemic. Again prevalence was particularly high in the Lake Basin and Coastal regions (73% and 68% respectively), areas where malaria is highly endemic. Men are also affected by IDA. In 1999, 46% of men aged 25 to 34 years were anemic (GOK & UNICEF, 2002). Presently, no data on severe anemia of preschool children, women of childbearing age or adult men are available.

IDA can be related to low supply of food groups rich in iron, particularly meat and offals. In Kenya, over the last decades, the supply of meat has been decreasing. Moreover, even when available, the cost of meat often limits its consumption by low-income households. Parasitic diseases, including malaria, also contribute to IDA (UNSTAT, Millennium Indicators Database).

Table 23: Prevalence of anemia in preschool children

Survey name/date (Reference)	Background characteristics	Age (years)	Sex	Sample size	Percentage of children with
					Any anemia (Hb<11.0 g/dL)
Anaemia and the Status of Iron, Vitamin A and Zinc in Kenya, 1999 (GOK & UNICEF, 2002)	**Total**	<5.99	M/F	2 738	89.0
	Region				
	Lake Basin	<5.99	M/F	450	91.3
	Western Highlands	<5.99	M/F	686	70.1
	Central Highlands	<5.99	M/F	442	31.5
	Dry, humid & semi arid areas	<5.99	M/F	510	58.3
	Coastal region	<5.99	M/F	659	85.1

Hb: Hemoglobin.

Table 24: Prevalence of anemia in women of childbearing age

Survey name/date (Reference)	Background characteristics	Age (years)	Sample size	Percentage of women with
				Any anemia (pregnant women Hb <11.0 g/dL; non pregnant women Hb <12.0 g/dL)
Anaemia and the Status of Iron, Vitamin A and Zinc in Kenya, 1999 (GOK & UNICEF, 2002)	**Total**	25-34	388	55.5
	Region			
	Lake Basin	25-34	77	72.9
	Western Highlands	25-34	113	47.0
	Central Highlands	25-34	41	17.1
	Dry, humid & semi arid areas	25-34	58	41.4
	Coastal region	25-34	99	68.2
				Percentage of pregnant women with
				Serum ferritin <40µ g/L
	Total	25-34	968	69.3

Hb: Hemoglobin.

Note: the sample represents mothers.

Table 25: Prevalence of anemia in adult men

Survey name/date (Reference)	Background characteristics	Age (years)	Sample size	Percentage of men with
				Any anemia (Hb <13.0 g/dL)
Anaemia and the Status of Iron, Vitamin A and Zinc in Kenya, 1999 (GOK & UNICEF, 2002)	**Total**	25-34	1 173	46.1
	Region			
	Lake Basin	25-34	188	42.7
	Western Highlands	25-34	343	25.1
	Central Highlands	25-34	151	24.6
	Dry, humid & semi arid areas	25-34	221	49.6
	Coastal region	25-34	270	31.4

Hb: Hemoglobin.

Interventions to combat IDA

There is routine supplementation with iron and folic acid through maternal and child health clinics and in 2003, 41% of women took iron tablets or syrups during pregnancy. Intake varied considerably by province. In the North Eastern and Central provinces, respectively 20% and 26% of women were given supplements, compared to 57% in the Coastal and 53% in the Nyanza province. Coast and Nyanza provinces are malaria-endemic areas therefore more active supplementation of women is implemented in these areas (CBS, MOH & ORC Macro, 2004).

Table 26: Iron supplementation: Percentage of mothers who took iron tablets/syrups during pregnancy

Survey name/date (Reference)	Background characteristics	Number of mothers with a birth in the 5 years preceding the survey	Percent who took iron tablets/syrups during pregnancy
Kenya Demographic and Health Survey 2003 (CBS, MOH and ORC Macro, 2004)	**Total**	4 052	40.5
	Residence		
	urban	835	39.4
	rural	3 217	40.8
	Province		
	Nairobi	307	36.1
	Central	495	26.2
	Coast	336	56.9
	Eastern	646	27.1
	Nyanza	643	52.7
	Rift Valley	1 052	41.3
	Western	470	51.1
	North Eastern	102	20.1

Other micronutrient deficiencies

The Government & UNICEF survey was the first nationwide survey on zinc deficiency. It showed that zinc deficiency is a public health problem. Individuals with serum zinc concentration <65µg/dL are considered at high risk of developing zinc deficiency. A large proportion of the population were affected, about 50% of children under 6 years and 50% of women (GOK & UNICEF, 2002). The high prevalence of stunting among preschool children could be due, at least in part, to zinc deficiency.

II.7 Policies and programmes aiming to improve nutrition and food security

Kenya first developed a Food Policy in 1981 with the major objective to support self-sufficiency in major foodstuffs and ensure equitable distribution of food of good nutritional value to the population. A review of this policy reinforced this objective in 1994. Following economic reforms and because of persistent poverty and hunger, a policy review addressing wider concerns of underlying causes of food insecurity and malnutrition, and calling for action is long overdue (ROK, 2004).

Currently, a review of the National Food and Nutrition Policy (NFNP) is being implemented. The NFNP should provide an enabling environment in which everyone has access to food through production or purchase. Past policies have failed to make the country food secure. A revised NFNP will propose measures to prevent and limit the negative impact of drought (e.g. through improved soil and water management). The new NFNP will also draw on international standards and policy statements, such as those elaborated by the International Conference on Nutrition (1992), the World Food Summit (1996), and the Millennium Development Goals (MDGs) (ROK, 2004).

The government put in place the Economic Recovery Strategy for Wealth and Employment (ERS). A key objective of the ERS is to ensure food security. There are a number of well-defined goals and

targets that the Government subscribes to in support of the reduction in poverty and hunger and for achieving food and nutrition security (ROK, 2004).

The Kenyan Coalition for Action in Nutrition (KCAN) held its first National Nutrition Congress in Nairobi in February 2005 and focused on various issues and strategies needed to deal with nutrition problems in Kenya. It provided a forum for discussion on diverse issues in nutrition ranging from research, policy and programs. The Ministry of Health reinforced the number of competent professionals in nutrition, realizing that diet, in most cases, is the first step in disease management. It is actually an indication that government is waking up, albeit late, to begin appreciating the need to focus on preventive rather than just curative measures. To enhance food and nutrition security, the Rural Outreach Program (ROP) is involved in spearheading a biodiversity campaign. This encourages the utilization of indigenous plant resources by enhancing their production and availability. The focus is mainly on leafy vegetables among low-income groups as a source of micronutrient and income (Oniang'o, 2005).

A review of nutrition information systems conducted by UNICEF and Save the Children-UK in 2004 concluded that there is need for improved methods of collecting and disseminating nutritional data for improved planning and programming. Moreover, there is a need to strengthen the integration of nutrition data with other types of information such as food security and poverty descriptors. The development of effective nutrition information systems in Kenya is a key strategy of the draft national food security and nutrition policy currently being developed by the Food and Nutrition Policy Unit and the Inter-ministerial Co-ordinating Committee on Food and Nutrition (ICCFN) (ROK, 2004).

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