Economic & Social Affairs

TRENDS IN SUSTAINABLE DEVELOPMENT

AFRICA REPORT

2008-2009

United Nations

Department of Economic and Social Affairs
Division for Sustainable Development

TRENDS
IN SUSTAINABLE DEVELOPMENT

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United Nations
New York, 2008

DESA

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FOREWORD

Since the United Nations Conference on Environment and Development in 1992 and the subsequent World Summit on Sustainable Development in 2002, significant efforts have been made in pursuit of sustainable development. At the political level sustainable development has grown from being a movement mostly focusing on environmental concerns to a widely recognized framework utilized by individuals, governments, corporations and civil society that attempts to balance economic, social, environmental and generational concerns in decision-making and actions at all levels. At the September 2005 World Summit, the UN General Assembly reiterated that "sustainable development is a key element of the overarching framework for United Nations activities, in particular for achieving the internationally agreed development goals", including those contained in the Millennium Declaration and the Johannesburg Plan of Implementation (A/RES/59/227).

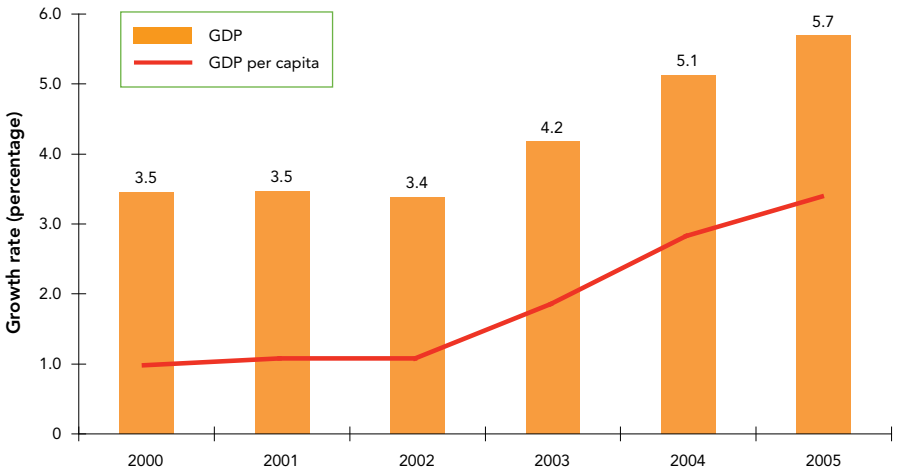
This report highlights key developments and recent trends in sub-Saharan Africa – the case of Africa being considered by the Commission on Sustainable Development at its 16th and 17th sessions (2008-2009). It notes progress in a number of areas while, at the same time, acknowledging that in other areas significant work is still needed to advance implementation of intergovernmentally agreed goals and targets.

Department of Economic and Social Affairs
Division for Sustainable Development
April 2008

CONTENTS

INTRODUCTION: GENERAL TRENDS

Growth in GDP and GDP per capita sub-Saharan Africa, 2000-2005



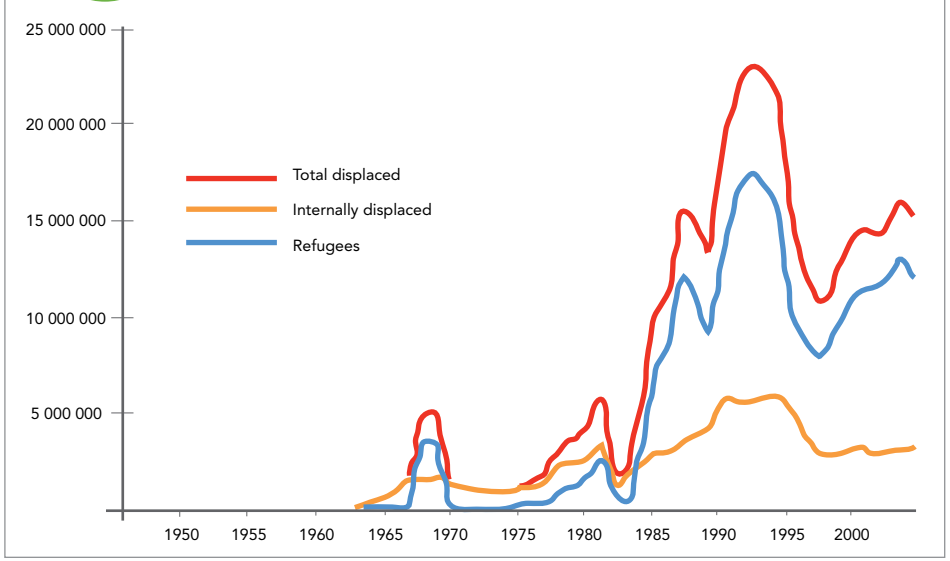
Source: World Development Indicators 2007.

A new growth trend has emerged since the beginning of the twenty-first century.

Reversing previous trends, African economies have performed well over the last six years. Sub-Saharan Africa's growth performance was underpinned by improvement in macroeconomic management in many countries, and strong global demand for key African export commodities, sustaining high export prices, especially for crude oil, metals and minerals.[1]

> "Together, by stepping up efforts to reach the Millennium Development Goals throughout the continent, we can and must make the 21st century the African century."
>
> Ban Ki-moon
> UN Secretary-General

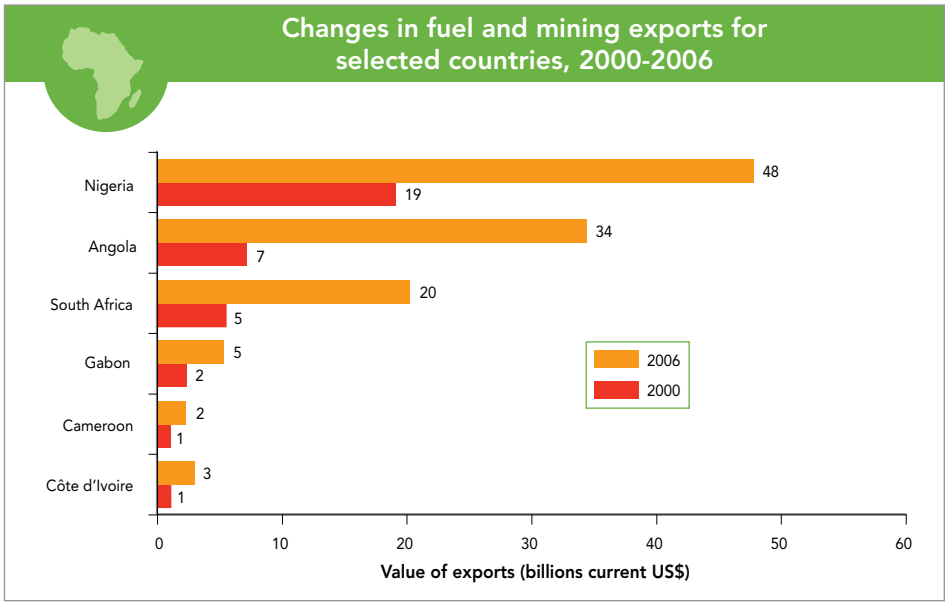
Displaced population, 1964-2004: Africa total



Source: DFID, 2006.

Conflicts have recently exhibited a declining trend.

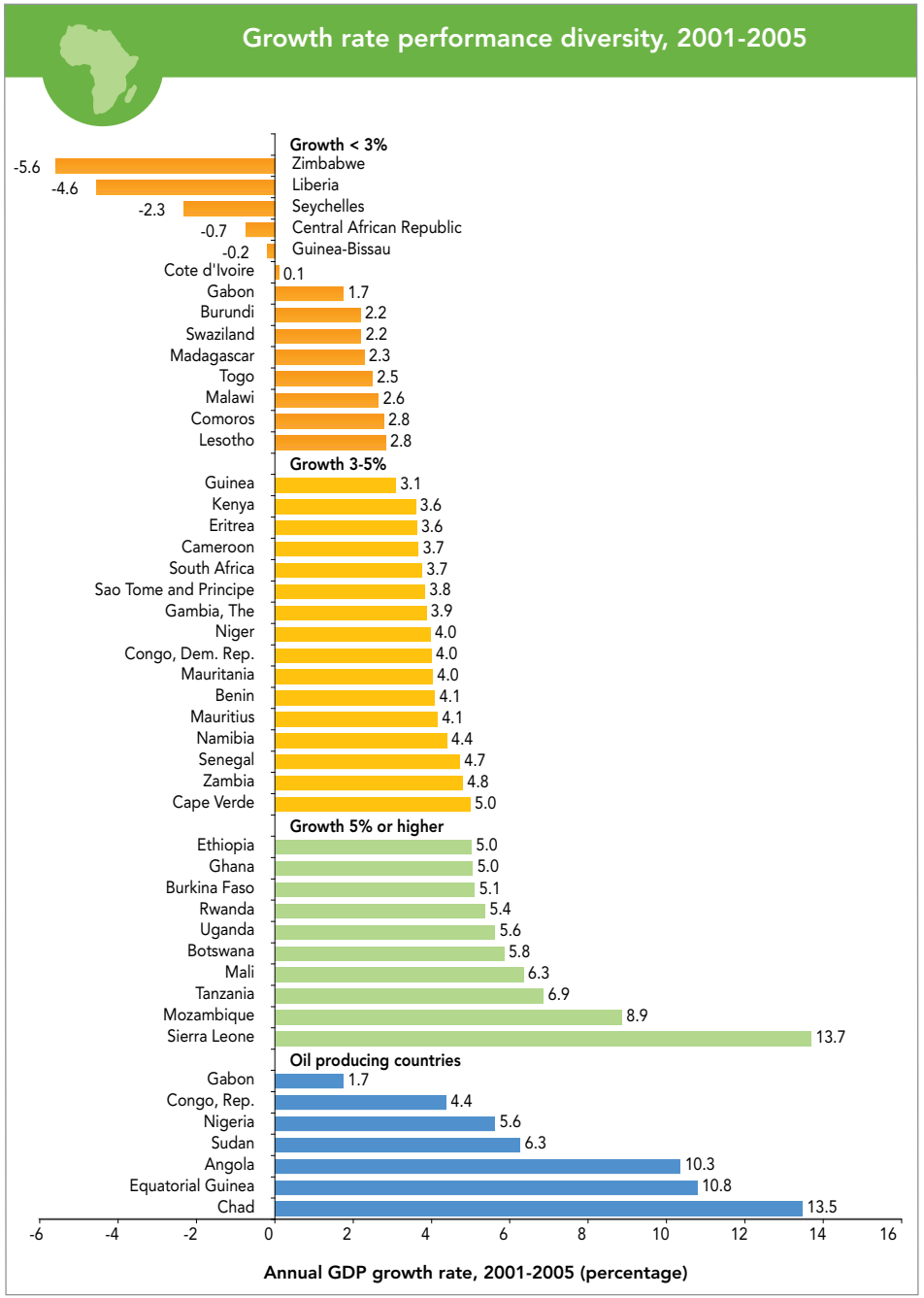
Sub-Saharan Africa has experienced numerous violent conflicts in the last 50 years. Conflicts have shown a decreasing trend in recent years. The number of displaced persons has also declined from a peak in the early 1990s.



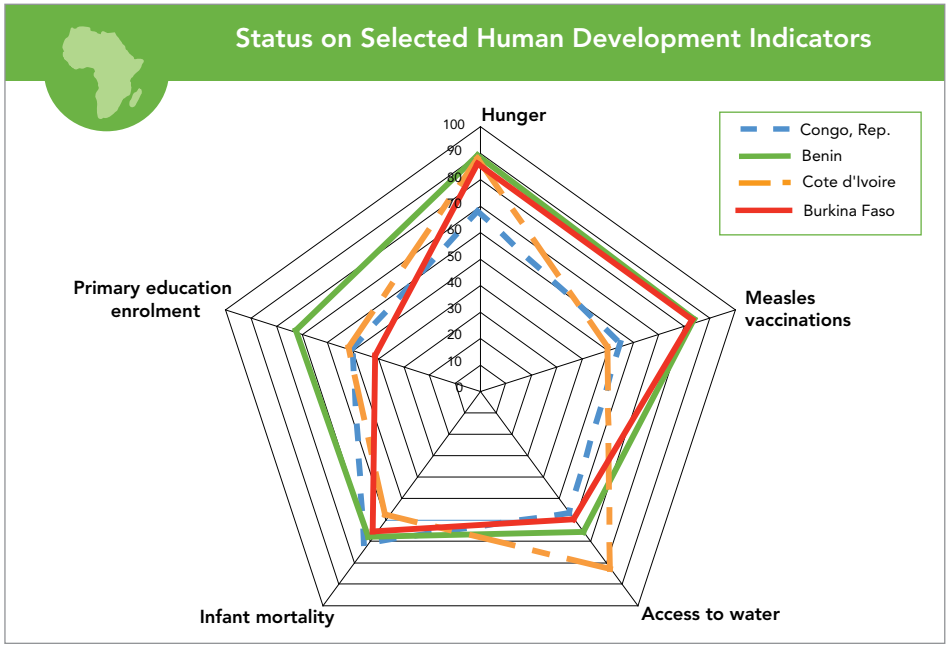
Source: WTO Statistics Database, 2008.

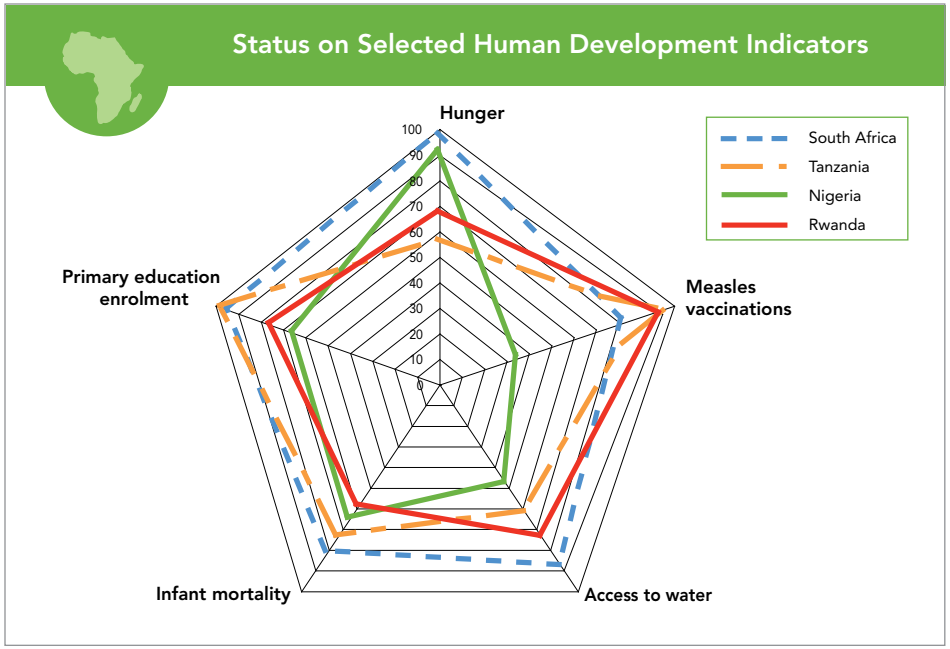
Sub-Saharan Africa's growth has been increasingly diverse.

Sub-Saharan Africa's recent growth has been boosted by sustained high prices of natural resources such as oil, gas and minerals, as well as a concomitant increase in a number of agricultural commodity prices. Oil and gas producers have benefited from massive inflows of revenues. The growth performance of non-oil-producing countries as a whole has also been strong over the past decade.[2] From 2001 to 2005, 10 non–oil producers, including agricultural countries like Burkina Faso, Ethiopia, Mali, Uganda and the United Republic of Tanzania, have registered annual GDP growth rates above 5 per cent.



Source: World Development Indicators 2007.





Achieving the Millennium Development Goals remains a challenge.

At the midway point between their adoption in 2000 and the 2015 target date for achieving the Millennium Development Goals (MDGs), sub-Saharan Africa is not on track to achieve any of the Goals.[3] Individual countries' performances on specific targets have been highly variable.

Note: Indicators for the five dimensions represented on the graphs have been constructed so as to range from 0 (worst case) to 100 (best case), as follows:

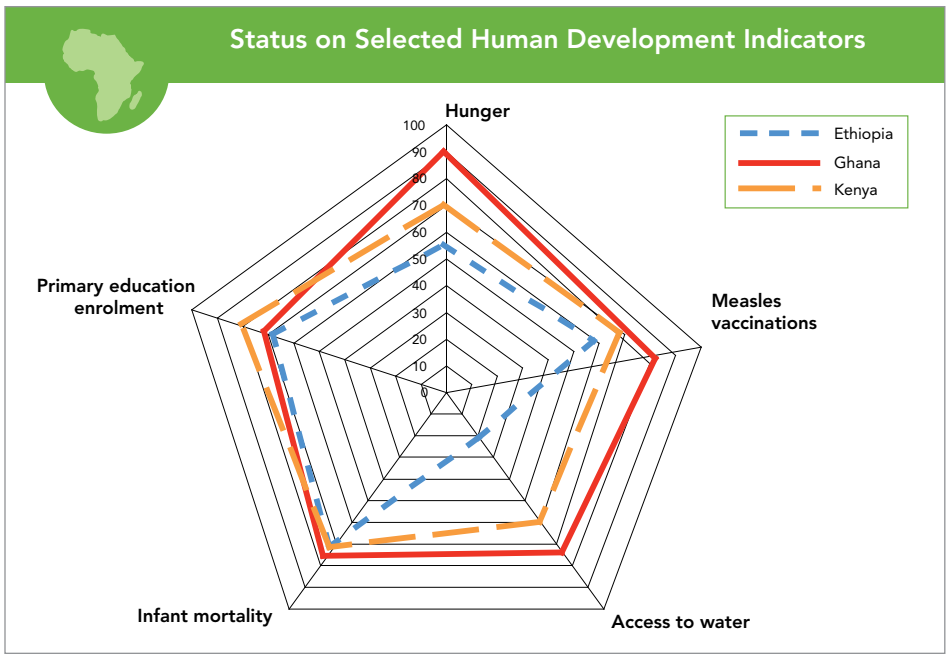
Hunger: Defined as 100 minus percentage of undernourished people. Source: World Development Indicators 2007.

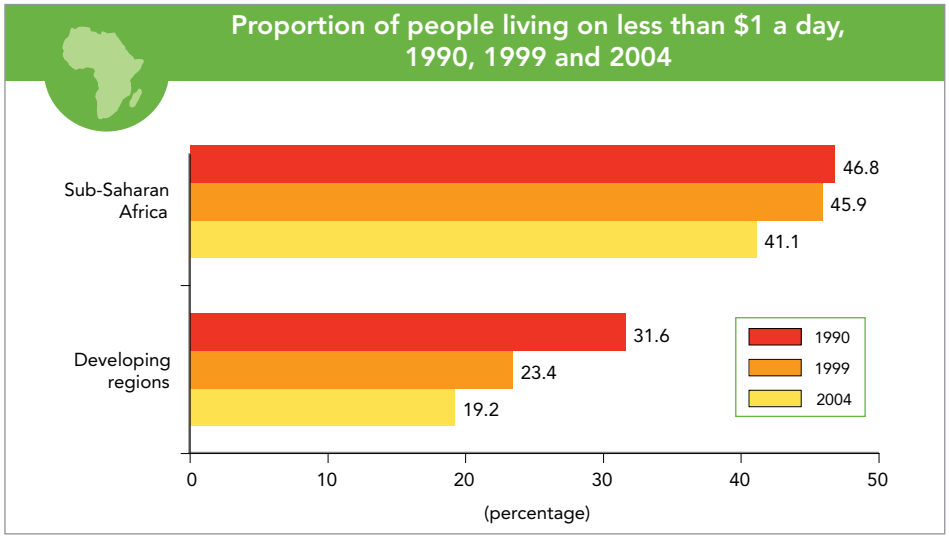
Infant mortality: Index equal to (mortality rate in worst performing country minus mortality rate in country considered)/(mortality rate in worst performing country minus mortality rate in best performing country). Source: UN-MDG website.

Education: Net enrolment rate in primary education, girls. Source: UN-MDG website.

Water access: Pproportion of population with access to an improved source of water, urban and rural, 2004. Source: Joint Monitoring Programme.

Measles vaccination: Percentage of children one-year-old immunized against measles, 2006. Source: UN-MDG website.





Source: United Nations, 2007.

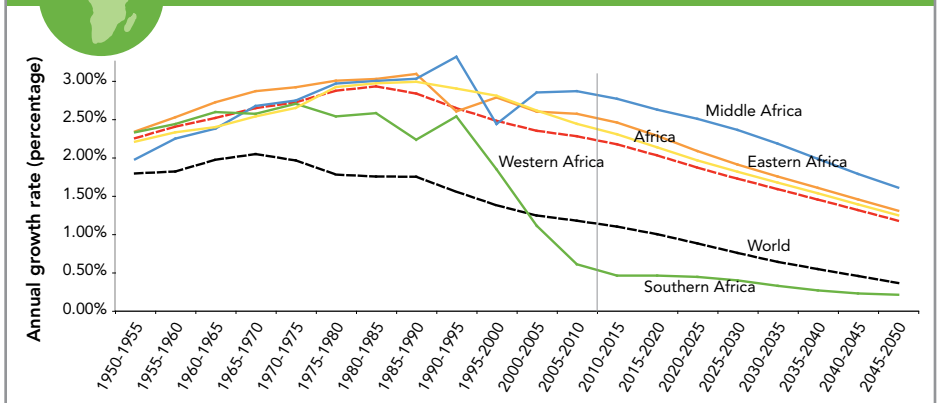
Poverty has been reduced but remains widespread, in spite of successes during the last decade.

The proportion of people living on less than US$1 per day has been decreasing, but less rapidly than in other developing regions. For sub-Saharan Africa as a whole, it remains at 41.1 per cent of the population, more than twice the level prevalent in the developing world.[4] Another indicator of poverty used to monitor the MDGs, the poverty gap, is also twice higher for sub-Saharan Africa than for developing regions as a whole. Although it has decreased slightly since 1990, the difference with other developing regions has increased. On current trends, the MDG1 target of halving dollar-a-day poverty will not be achieved in sub-Saharan Africa.

> “Nous n’héritons pas de la terre de nos parents, nous l’empruntons à nos enfants.”
>
> Léopold Sédar Senghor
> Former Senegal President

DEMOGRAPHIC TRENDS

Population growth rate 1950 - 2050

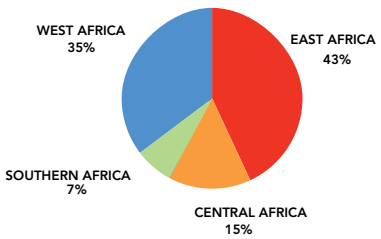


Source: UN-DESA, 2007.

Population growth is still strong.

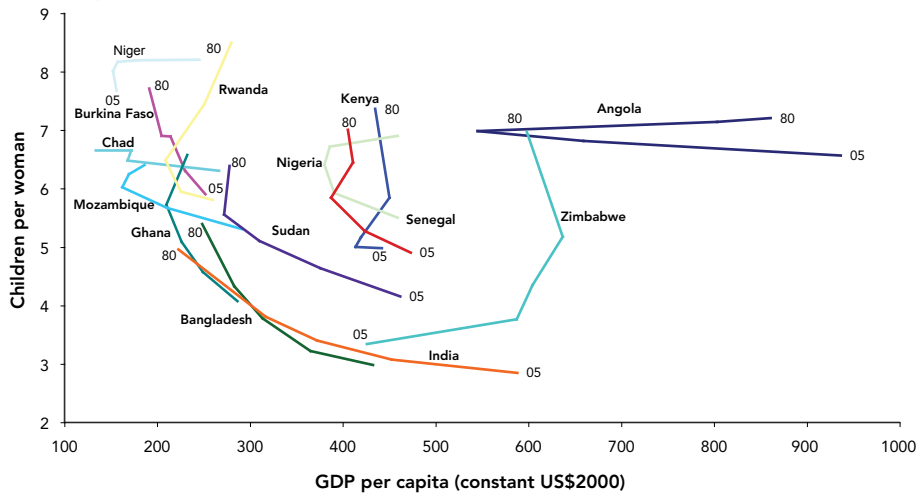
In 2007, sub-Saharan Africa had a population of 784 million people. African population has continued to grow at a very high pace during the last decade, although growth rates have begun to decline since around 1985. Whereas population growth in Southern Africa has plummeted and is expected to remain just above zero in the coming decades, mostly due to the toll of HIV/AIDS in that subregion, growth rates in other subregions are only slowly decreasing and are projected to remain above 1.5 per cent annually to 2040.

Total sub-Saharan Africa Population = 784 millions in 2007



Source: UN-DESA, 2007.

Fertility and GDP per capita, selected countries

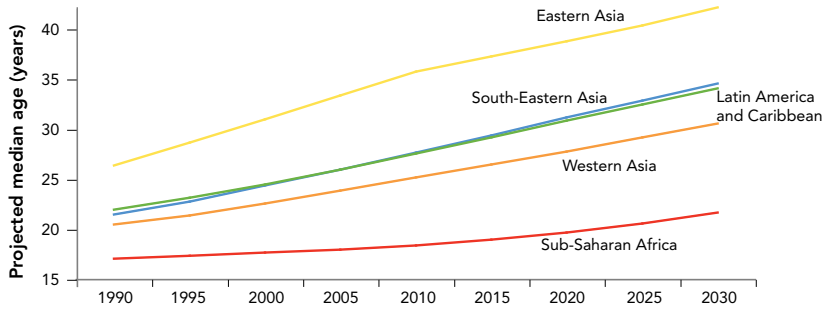


Source: World Development Indicators 2007.

Fertility rates have decreased, but less rapidly than in other regions.

Part of the explanation of the rapid demographic growth lies in very high fertility rates. In countries like Angola, Burkina Faso, Chad and Niger, the average number of children is still above 6 per woman. By contrast, Zimbabwe, Kenya, Ghana and Sudan seem to be on a rapid transition pattern towards lower fertility levels. Fertility rates tend to decrease over time, notably with rising incomes.

Changes in median age, 1990-2030, selected developing regions

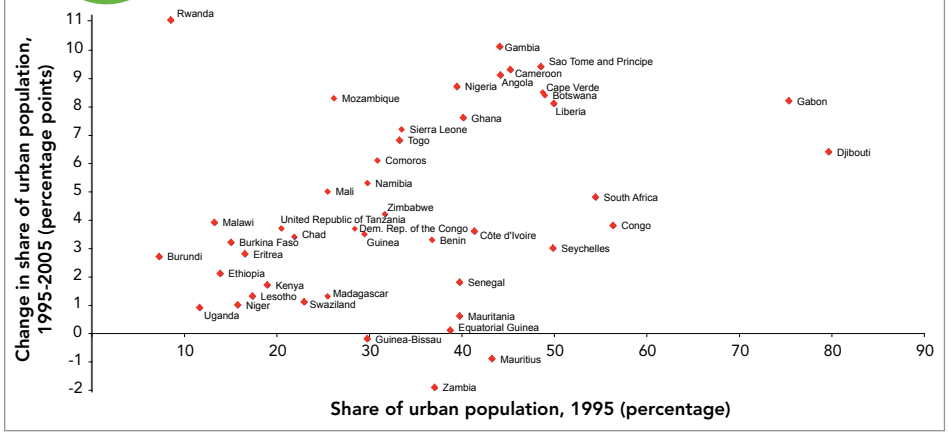


Source: UN-DESA, 2007.

Compared to other developing regions, sub-Saharan Africa's population is very young.

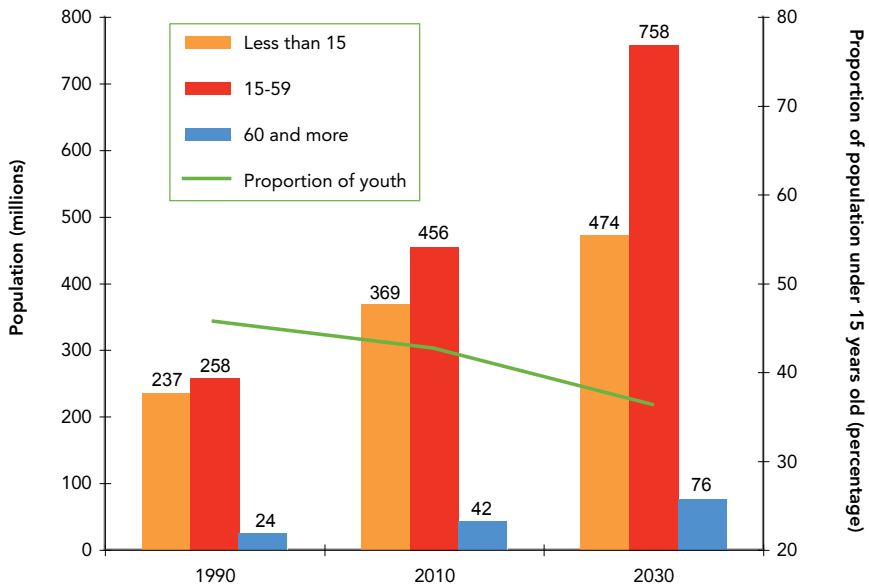
Currently, half of the population is less than 18 years old, whereas the median age is close to 25 or higher in Southern Asia and Latin America, and close to 35 in Eastern Asia. The difference between the age structure of population in Africa and in other developing regions is expected to increase over time. In 2030, the median age would be around 22 years in sub-Saharan Africa, whereas all Asian subregions and Latin America would have much older populations.

Urbanization Trends in Sub-Saharan Africa



Source: UN-DESA, 2007.

Changes in Population Structure, 1990-2030



Source: UN-DESA, 2007.

Working age population will continue to grow rapidly.

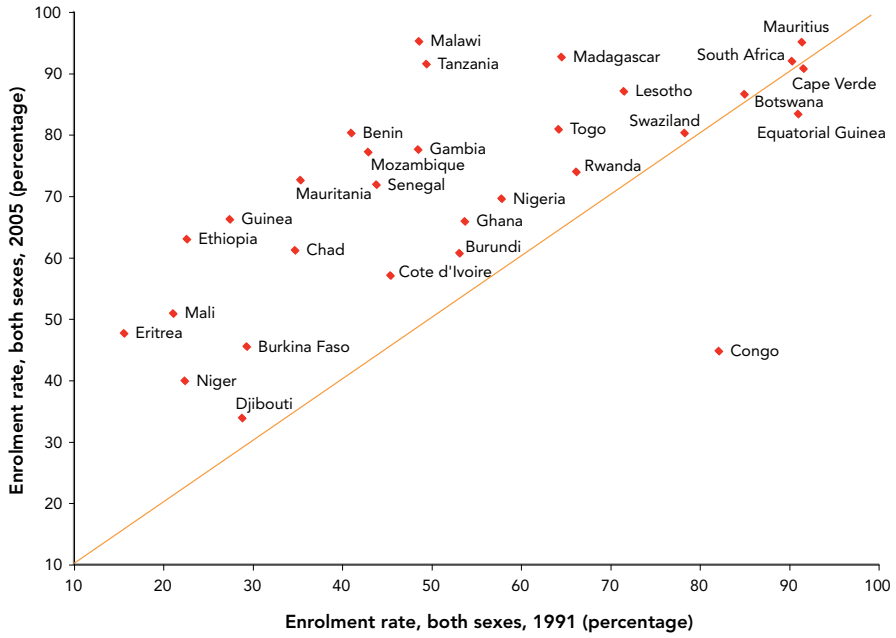
High fertility rates will translate into rapid population growth well into the century. From 520 million in 1990, population is expected to reach 1.3 billion by 2030. The share of people under 15 in total population is expected to decline only slowly, from 46 per cent in 1990 to 36 per cent in 2030. Population aged 15 to 59 is expected to grow from 456 million in 2010 to 758 million in 2030. This young population structure represents a particular challenge for African countries for education and employment.

Africa offers stark contrasts in terms of urbanization.

Countries like Burundi, Rwanda, Malawi, Ethiopia and Burkina Faso are still overwhelmingly rural, whereas in Djibouti and Gabon more than 80 per cent of the country's population lives in urban areas. Between 1995 and 2005, some countries have witnessed fast growth of urban population. Nigeria, the most populous country in sub-Saharan Africa, has seen the proportion of people living in urban areas grow from 44 to 52 per cent in 10 years. Urban growth, often reflecting sizeable migration flows from rural areas, presents daunting challenges for development, as inflows of migrants into the cities have to be provided with access to land, infrastructure and basic services.

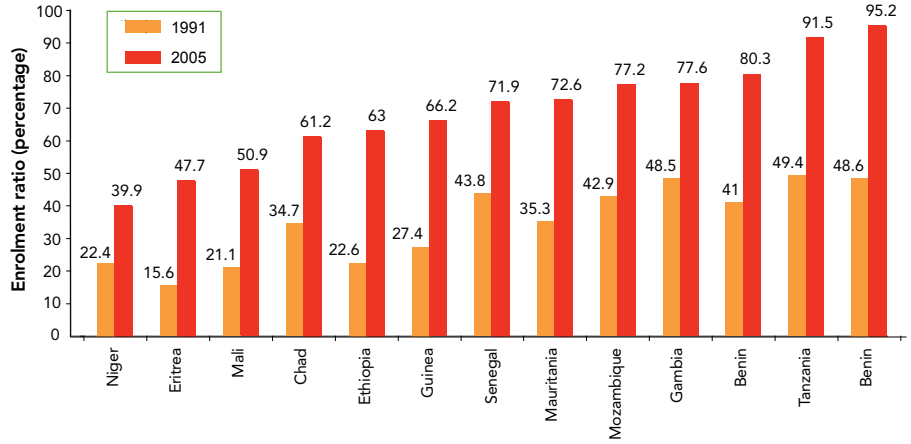
EDUCATION

Enrolment in primary education, 1991-2005



Source: UN MDG website, 2007.

Countries having registered strong improvements in their enrolment ratio in primary education, 1991-2005



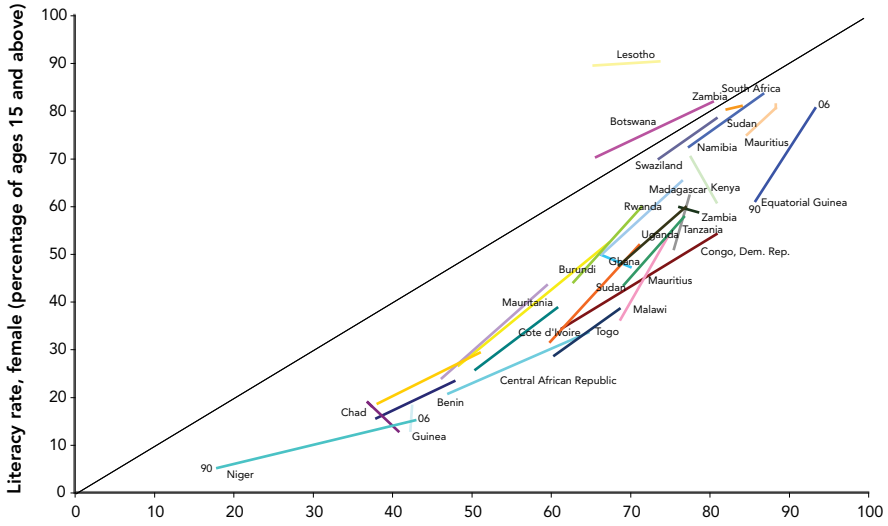
Source: UN MDG website, 2007.

Access to primary education has progressed strongly in most countries.

Trends in education are encouraging, with a marked increase in primary enrolment for most countries over time, as well as a reduction in the gender gap in school attendance. Ghana is successfully implementing a national school feeding programme using locally produced foods. Kenya, the United Republic of Tanzania, Uganda and many other countries have abolished fees for primary schools resulting in dramatic increases in enrolment during the space of a few years.[5]

> "Instruction in youth is like engraving in stones."
>
> African proverb

Adult literacy by gender, changes 1990-2006



Source: World Development Indicators 2007.

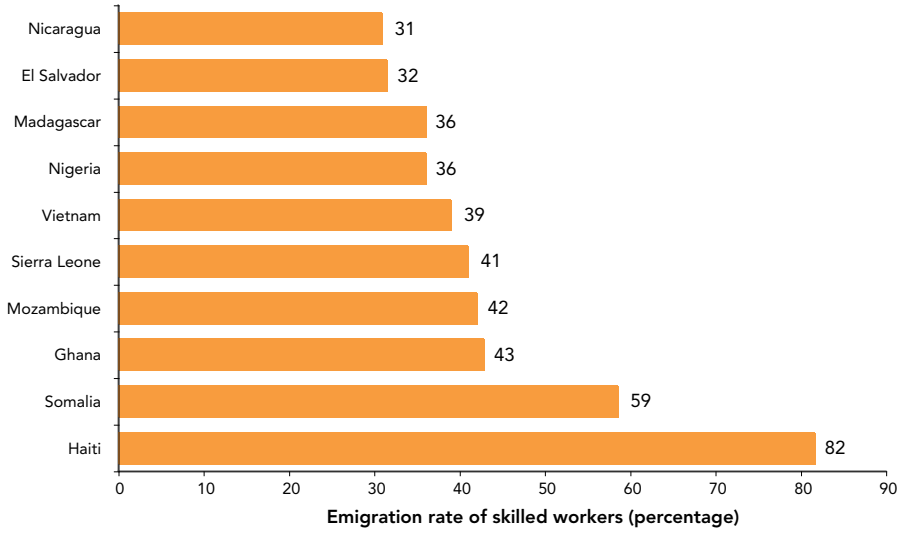
Adult literacy is improving.

Although there are important differences across African countries in literacy rates, adult literacy has shown consistent improvement over time in most countries. Across countries as well as over time, male literacy rates tend to increase first, female literacy catching up at a later stage. According to international statistics, Lesotho and Botswana are exceptions to this rule, with higher literacy rates for females than for males. Zambia, Swaziland, South Africa and Namibia all have both high literacy rates and very similar literacy rates for men and women.

Emigration of skilled workers remains pervasive.

Africa has often been highlighted as the continent that suffers most from brain drain. The region has remained an area of net out-migration to the rest of the world, especially for skilled migrants. Among the 10 countries with more than 4 million inhabitants having the highest emigration rates of skilled workers to OECD countries, six are African countries. Somalia is estimated to be second only to Haiti in terms of emigration of skilled workers.[6]

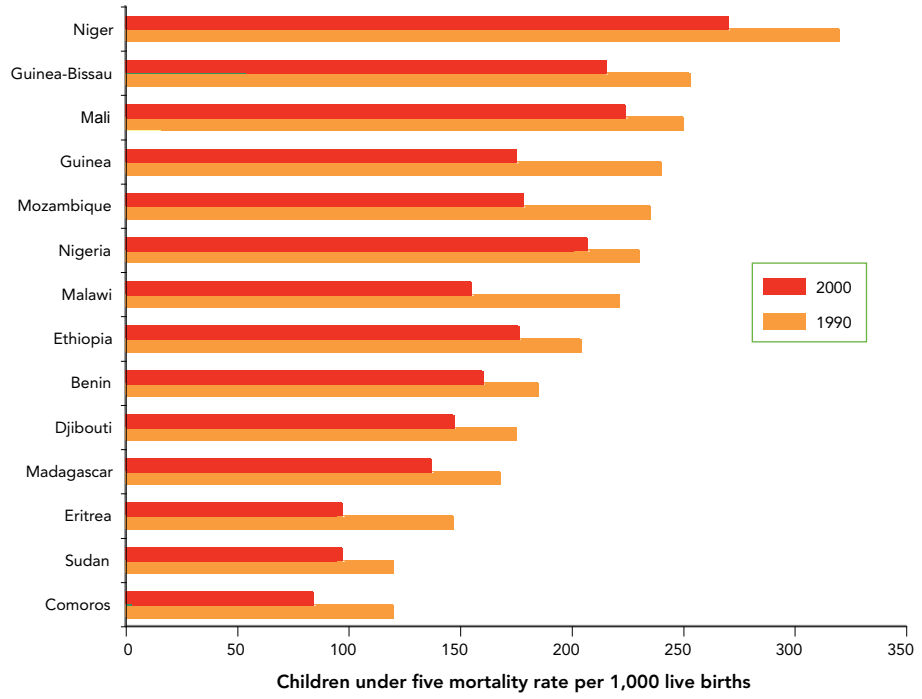
Countries with highest estimated emigration rate of skilled workers in 2000 (countries with more than 4 million population)



Source: UNCTAD, 2007, from Docquier and Marfouk, 2004.

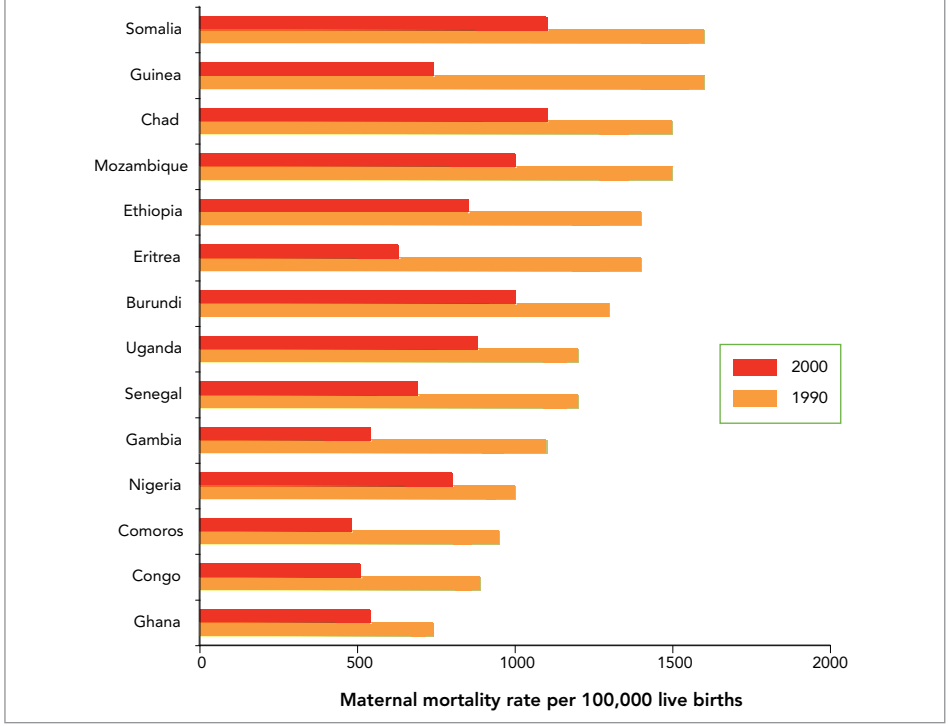
HEALTH

Strong performers in reducing child mortality 1990-2000



Source: UN MDG website, 2007.

Strong performers in reducing maternal mortality 1990-2000

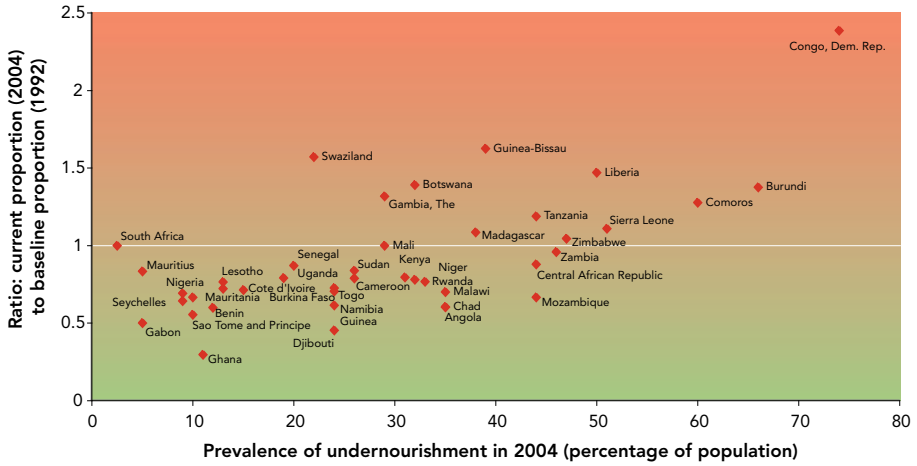


Source: UN MDG website, 2007.

Progress has been made with respect to health conditions.

Child mortality and maternal mortality are among the highest in sub-Saharan Africa. Low incomes, insufficient health infrastructure, difficulties of access to health facilities, and high prevalence of endemic diseases are among the explanations. However, there has been progress in the reduction of child mortality over time. Also, some countries have achieved impressive performances in reducing maternal mortality.

Change in the proportion of undernourished people between 1992 and 2004



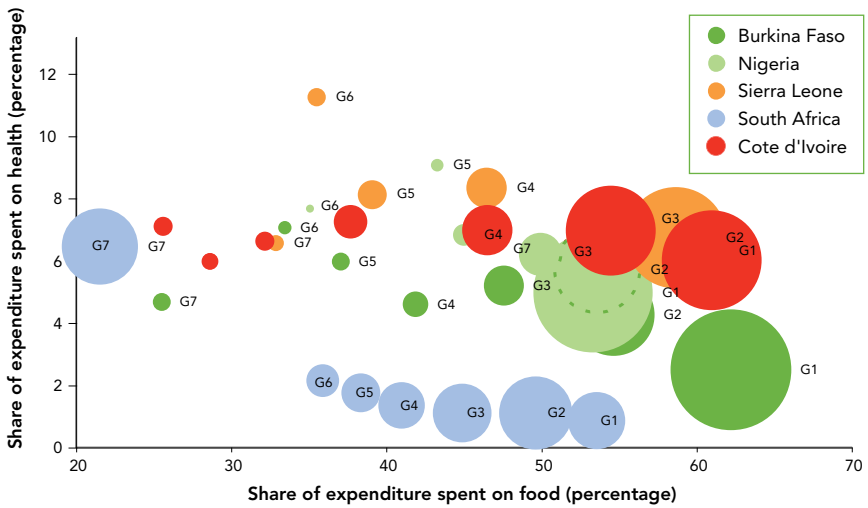
Source: FAO, 2006.

Undernourishment is still a concern in a number of African countries.

In four countries (the Democratic Republic of the Congo, Burundi, the Comoros and Sierra Leone), it is estimated that more than half of the population was undernourished in 2004. During the 1990s, many countries have succeeded in reducing the proportion of their population that is undernourished. However, in 12 countries out of 42 for which statistics are available, the proportion of undernourished people is estimated to have risen between 1992 and 2004.[7]

> "Sub-Saharan Africa has about 11 percent of the world's people, but it carries 24 percent of the global disease burden in human and financial costs."
>
> Lars Thunell
> Executive Vice President and CEO, IFC

Shares of expenditures spent on food and health by income bracket - selected countries

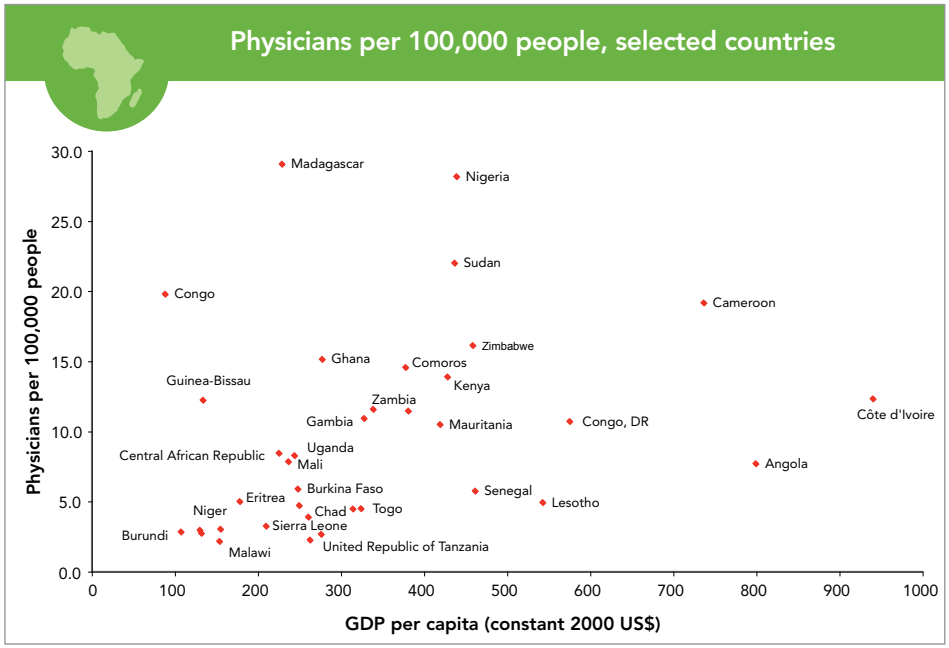


Source: IFC, 2007.

Note: G1-G7: Income cutoffs are given in 2002 international dollars, adjusted for purchasing power parity (PPP). G1: less than 500; G2: 500-1,000; G3: 1,000-1,500; G4: 1,500-2,000; G5: 2,000-2,500; G6: 2,500-3000; G7: more than 3,000. The size of the bubbles represents the relative size of the income group in the population.

Expenditures on health by households are limited by severe constraints.

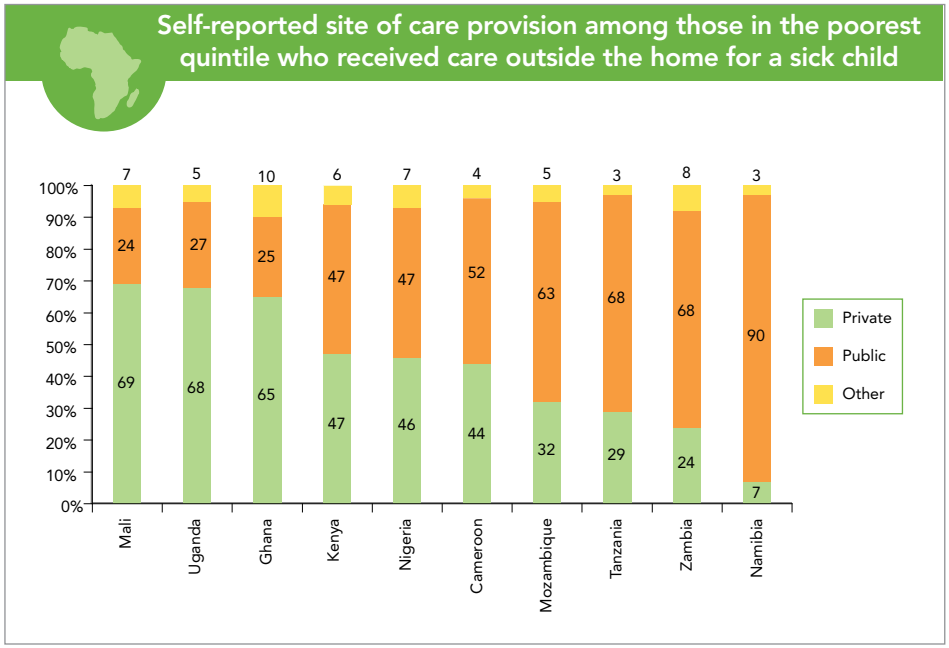
Consistently across countries, the lowest income groups, which often represent the vast majority of the population, spend more than half of their budgets on food. As income rises, the proportion of income spent on food tends to decline sharply, allowing for a greater portion of expenditures to go to health and other uses. In Nigeria, the population earning less than US$ 500 per year in purchasing power parity units (PPP) represents 59 per cent of total population. This income group spends 54 per cent of income on food and 4 per cent on health. At the opposite end of the spectrum, people earning more than US$ 3,000, representing less than 0.1 per cent of the population, spend 30 per cent of income on food and 17 per cent of income on health.[8]



Source: WHO, 2006.

Health infrastructure and personnel are still inadequate.

As a whole, Africa lacks the infrastructure, facilities and trained personnel necessary to deliver adequate levels of health services. Sub-Saharan Africa is home to just 3 per cent of the world's health workers.[9] Although the number of physicians tends to be higher in countries with higher GDP per capita, there are wide differences even between countries at similar income levels. Many countries report difficulties in staffing their public health facilities. The continent suffers from a drain of its health professionals, many of whom leave to work in developed nations. In 2002, up to 30 per cent of nurses from Senegal and Ghana were working outside sub-Saharan Africa.[10] UNCTAD reports estimate that 15 per cent of the physicians trained in Ethiopia resided in the United States of America or Canada in 2002. Figures for other countries were: 20 per cent for Uganda, 10 per cent for Zambia and 43 per cent for Liberia.[11]

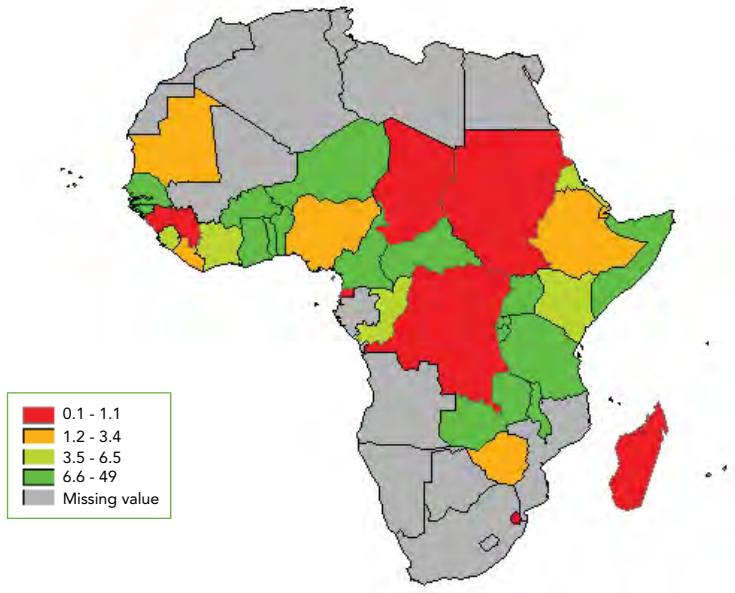


Source: IFC, 2007.

In a region where public resources are limited, the private sector is already a significant player in health care.

The role of for-profit companies, non-profit organizations and social enterprises, along with private insurers and providers, is growing. According to a recent IFC study, of total health expenditure of $16.7 billion in 2005, roughly 60 per cent—predominantly out-of-pocket payments by individuals—was financed by private parties, and about 50 per cent went to private providers. The study also found that many of the region's poor people, both urban and rural, rely on private health care.[12] Many forms of health insurance schemes exist in sub-Saharan Africa, but they cover only a very small proportion of the population. Government social security programmes or private sector insurance currently account for only a small proportion of total health expenditure in the majority of sub-Saharan African countries. In a study of 12 primarily West African nations, only 2 per cent of the population was enrolled in community insurance plans.[13]

Children under five sleeping under mosquito nets (percentage)

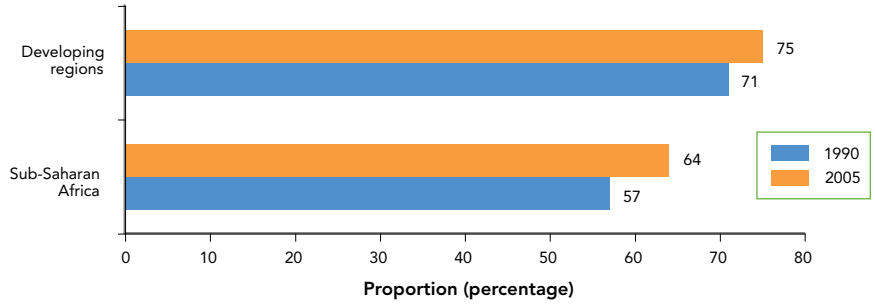


Source: UNICEF, 2006.

African countries continue to face the challenge of deadly diseases, especially malaria.

Malaria remains a pervasive health problem on the continent, accounting for one death every 30 seconds. The majority of cases occur in children under the age of five. Economic losses from malaria in sub-Saharan Africa have been estimated to amount to US$ 12 billion annually. Infection by malaria is also a persistent cause of poverty, because weakness caused by the disease in adults can severely impair their ability to work, limiting the means of livelihood for families and communities. Successfully fighting malaria supposes a holistic approach, which includes: vector control (by environmental management and use of bio- and other pesticides); prevention, of which a successful example is investment in insecticide-treated bednets; use of affordable anti-malarial treatments; better data on prevalence and transmission of the disease; and community involvement.

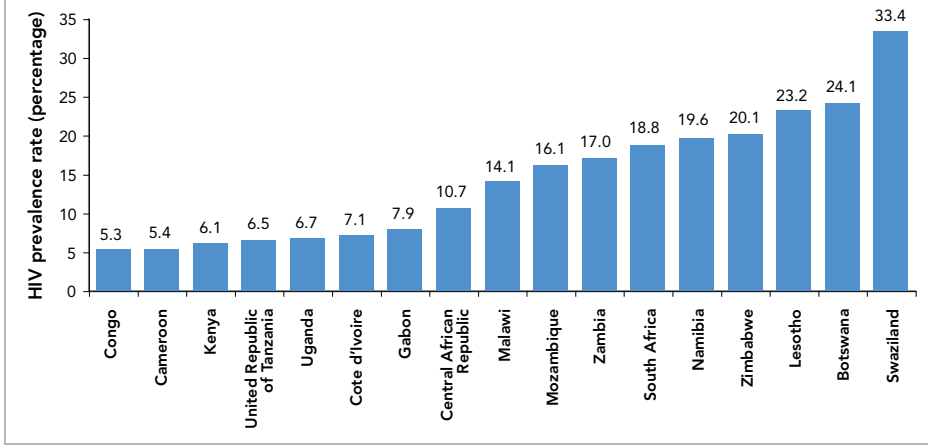
Percentage of children 12-23 months old who received at least one dose of measles vaccine



Source: United Nations, 2007.

Between 2000 and 2006, deaths from measles in Africa have dropped by 91 per cent, from an estimated 396,000 to 36,000, thus achieving the United Nations goal to cut measles deaths by 90 per cent four years early. This success reflects national Governments' commitment to fully implement measles reduction strategies, including vaccinating all children before their first birthday and providing a second opportunity to be vaccinated through mass campaigns. [14]

Countries with more than 5 percent estimated HIV prevalence rate (adults 15-59) in 2005



Source: UNAIDS/WHO, 2006.

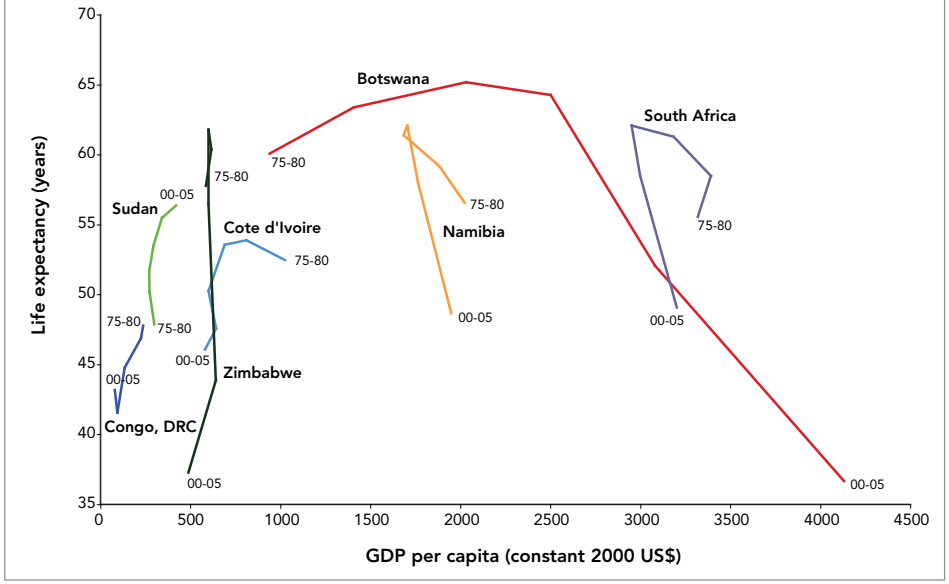
Currently, more than 22 million Africans live with HIV.

In 2007, 1.6 million of the 2.1 million AIDS deaths worldwide occurred in Africa.[15] In the 38 hardest-hit African countries, it is projected that there will be 19 million additional deaths due to AIDS between 2010 and 2015. [16]

HIV/AIDS rates exhibit a lot of variation within countries. Successfully addressing the epidemic supposes a fine knowledge of its spatial configuration as well as the main propagation and transmission factors. New infections are statistically linked to transport infrastructure (transit roads, ports, urban centres) and people in certain professions (including the transport sector) are more at risk.

Note: Prevalence figures for Africa have been subject to debate. Year-to-year comparisons of prevalence rates given in UNAIDS reports are not statistically meaningful.[17] Indirect approaches based on death statistics point to lower numbers in most countries.[18] UNAIDS recently revised its HIV figures for Africa significantly downwards.

Changes in life expectancy, 1975-2005, selected countries

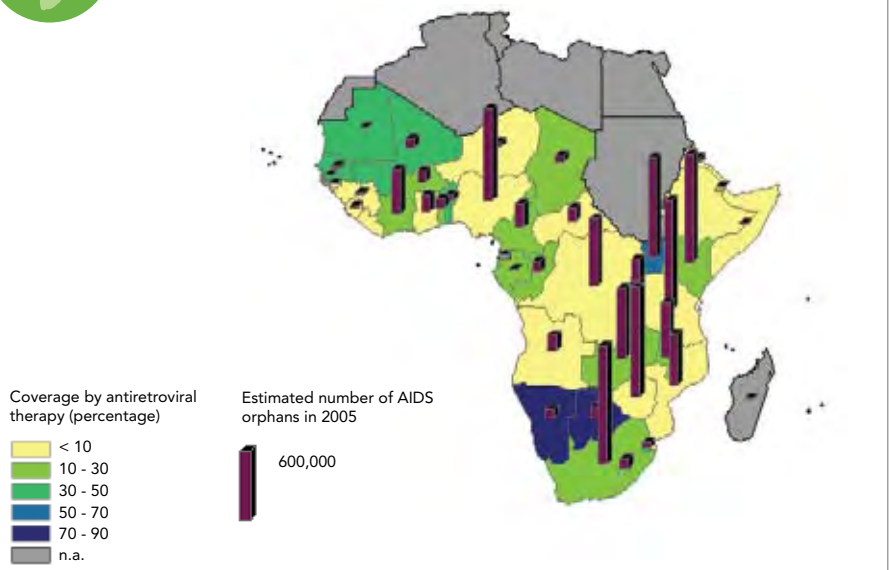


Source: UN-DESA, 2007.

The AIDS epidemic has already caused massive changes in the population structure of some African countries.

Whereas life expectancy has risen in most African countries during the second half of the last century, it has declined by almost 30 years in Botswana, 25 years in Zimbabwe and 15 years in South Africa since the beginning of the AIDS epidemic. In some other countries of the continent, the observed fall of average life expectancy reflects other types of events like conflicts. Both types of events, by severely affecting family structures, asset distribution and labour supply, can have a tremendous impact on poverty.

Coverage by antiretroviral therapy (percentage)

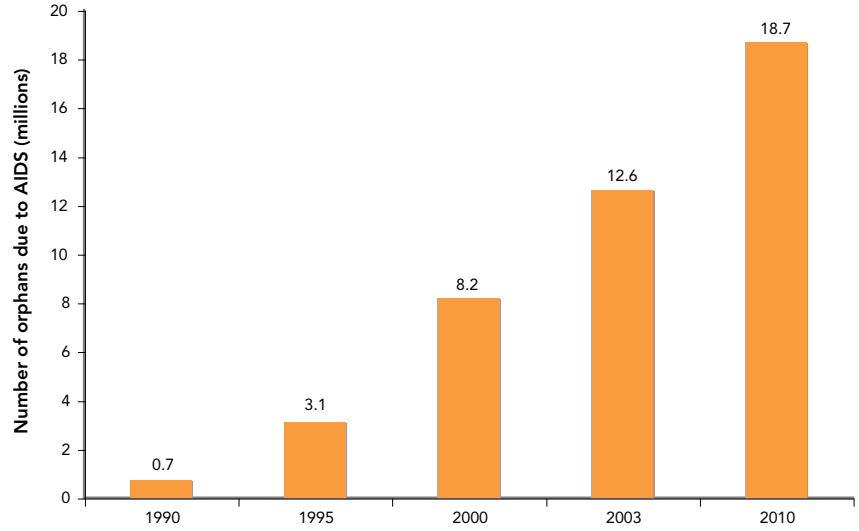


Source: WHO, 2006.

Access to antiretroviral therapy is considered crucial for the treatment of infected people.

The number of people receiving such treatment has increased rapidly over the last five years. In sub-Saharan Africa, this number more than doubled from 310,000 to 810,000 within the last year. About one sixth of the 4.7 million people who need treatment now receive it. There are major differences in progress between countries. Coverage has increased very rapidly to levels of 50 per cent or higher in some countries, such as Botswana and Uganda, while others still have coverage levels below 10 per cent. South Africa now accounts for one quarter of those receiving treatment in the region, with approximately half provided through private sector facilities.

Children orphaned by AIDS in sub-Saharan Africa



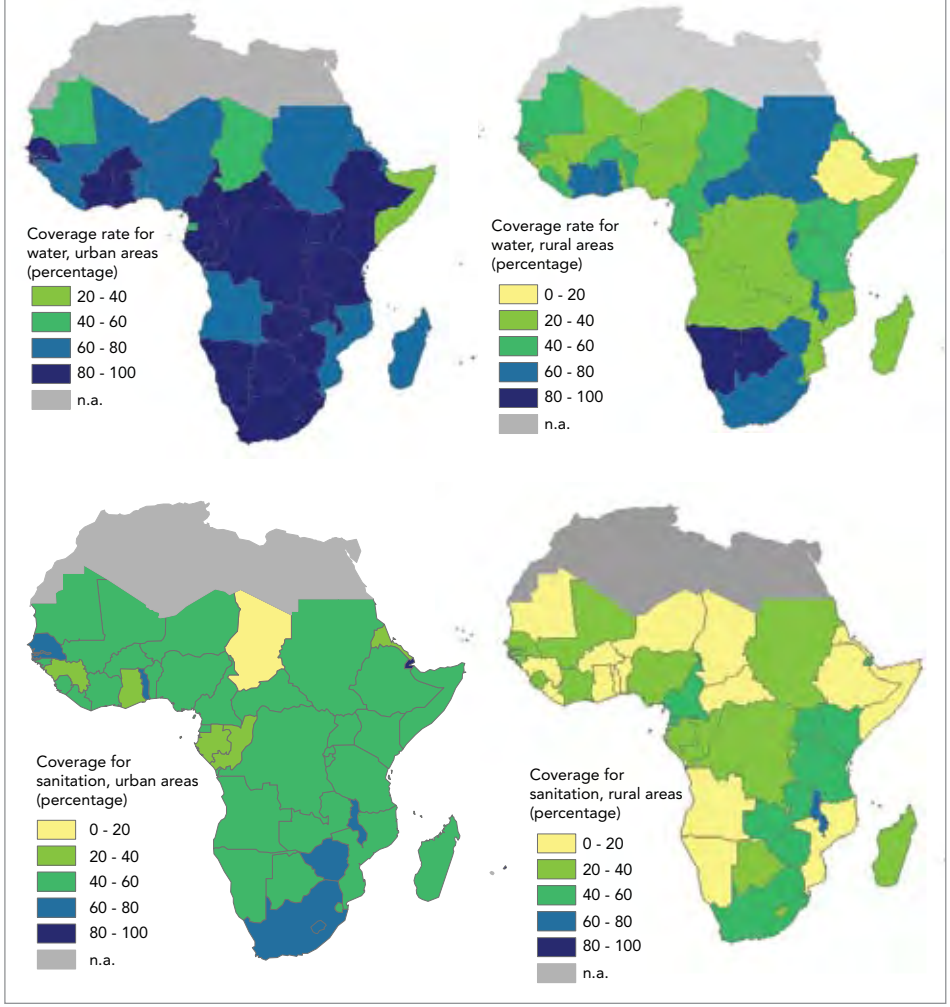
Source: UNAIDS/USAID/UNICEF, 2004.

The number of children orphaned by AIDS in sub-Saharan Africa is projected to continue to increase rapidly.

Although a massive increase in the availability of antiretroviral therapy could bring the projected figures down to some extent, it is expected that AIDS orphans will increase rapidly in the next years. In Botswana, Lesotho, Swaziland and Zimbabwe, more than one in five children will be orphaned in 2010.[19] AIDS is more likely than other causes of death to create double orphans. Therefore, countries with high levels of HIV/AIDS will also have a disproportionate number of double orphans as the epidemic advances. Sub-Saharan Africa had almost as many double orphans in 2003 (7.7 million) as Asia (3.9 million), although Asia has about four times more children than sub-Saharan Africa and twice as many total orphans.

> “The vision which fueled our struggle for freedom… will be needed if we are to bring AIDS under control. This is a war.”
>
> Nelson Mandela
> Former South African President

Access to safe drinking water and sanitation

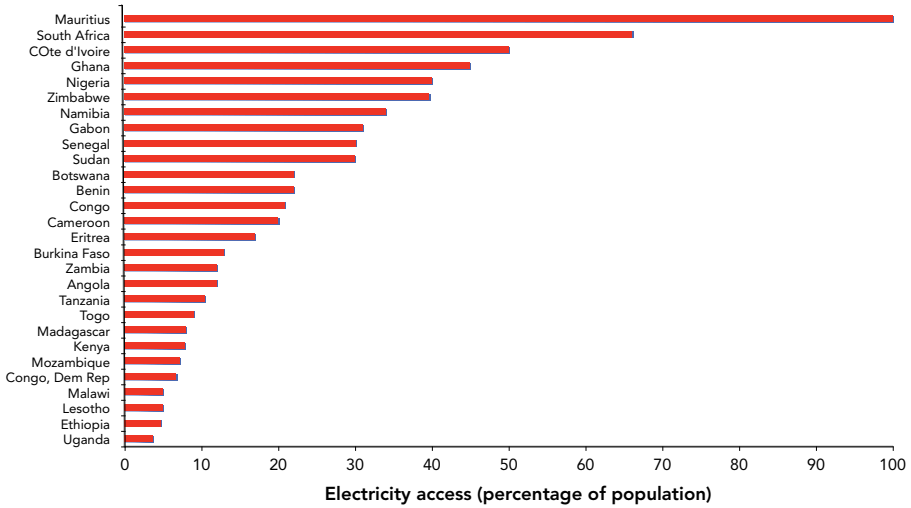


Source: Joint Monitoring Programme, 2006.

Lack of access to safe drinking water and sanitation remains widespread.

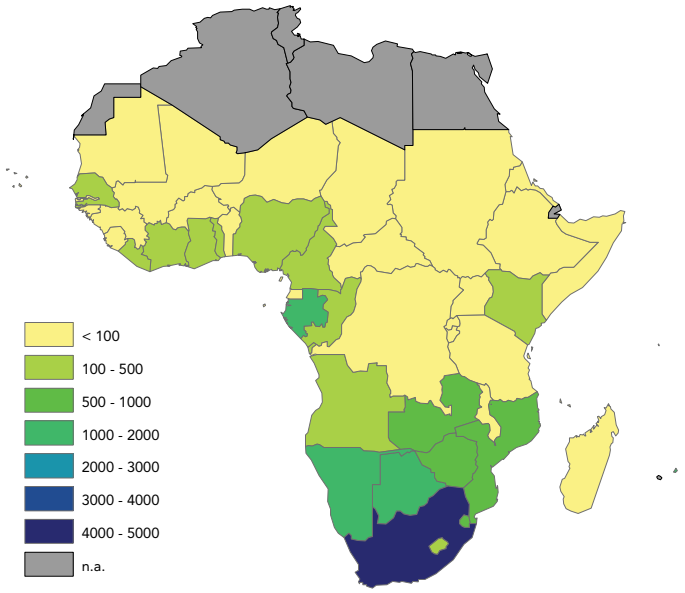
Many countries registered encouraging improvements of their coverage rates between 1990 and 2004. However, access remains far from being universal even in the richest countries of the region. For both water and sanitation, there is a sharp difference between urban and rural areas, the latter often lagging behind. There is also a gap between water and sanitation coverage, which has important consequences for health. Untreated sewage effluents contaminate drinking-water sources, as well as rivers and watersheds that are critical for agriculture, food resources and wildlife.

Access to electricity, 2000



Source: IEA, 2002.

Electric power consumption per capita (kWh)



Source: AFDB, 2007.

Compared with Europe and the Middle East, Africa at night seen from space is mostly dark with a few bright spots corresponding to the North African coast, the Nile valley in Egypt, South Africa, the coast near the Congo and the Niger Delta.

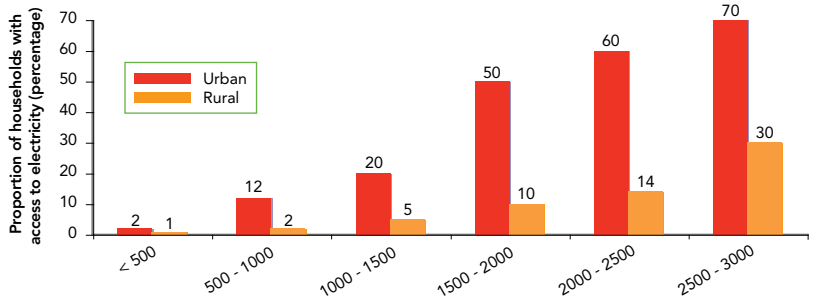
More than 500 million sub-Saharan Africans do not have access to modern energy.

Access to electricity, as well as electricity consumption, vary widely across countries. Per capita electricity consumption in South Africa is about a hundred times the average consumption in Sahel countries. Within countries, access to electricity tends to be higher in urban areas and to increase with income. The cost of lighting with alternative energy sources takes substantial portions of income in the poorest households. Lack of access to modern energy results in air pollution, acute health problems, and environmental problems linked to overconsumption or inadequate management of wood resources.

Sub-Saharan Africa accounts for over a tenth of the world's population, but generates only 3 per cent of global electricity.

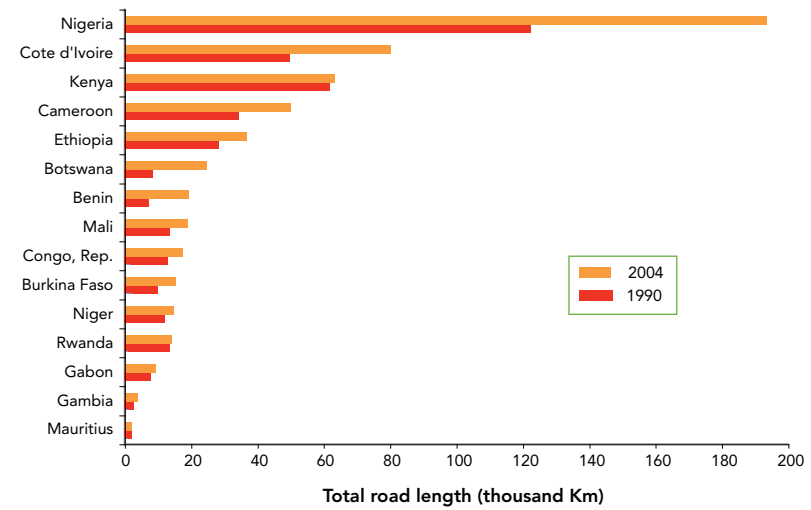
A large share of it (71 per cent) is produced by South Africa alone. Although coal-fired power stations predominate in South Africa, the rest of the continent remains largely dependent on hydropower. The need for more power stations in the rest of the continent has long been recognized. In many countries, electricity demand continues to grow, fuelled in particular by growth in incomes and rural-urban migrations.

Access to electricity and income - Uganda



Source: IFC, 2007.

Road total length, 1990-2004

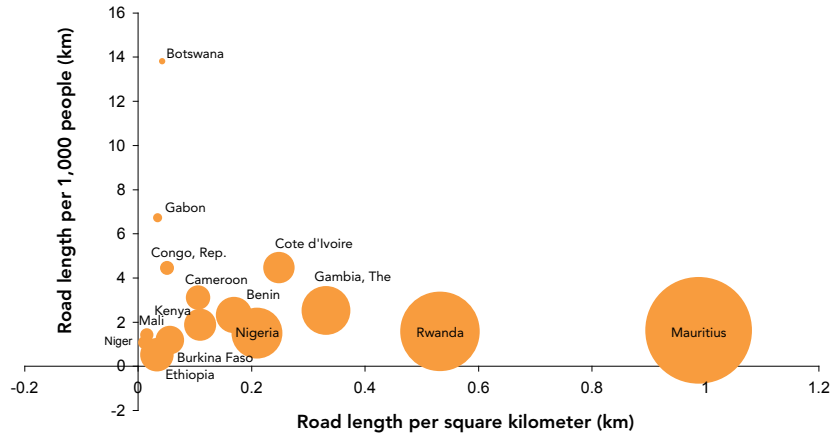


Source: World Bank, 2006.

Roads are still insufficiently developed.

Low population densities in some countries like Gabon or Botswana translate into high per capita cost of road networks. Countries with high population densities, like Rwanda, the Gambia and Nigeria, tend to have more developed road networks. In addition to the length of road networks, poor quality of roads due to inadequate maintenance is a recurrent problem in many countries. Lack of adequately maintained roads often translates into obstacles to economic development, especially in countries where agriculture still constitutes the economic backbone and access to markets from rural areas remains a critical problem.

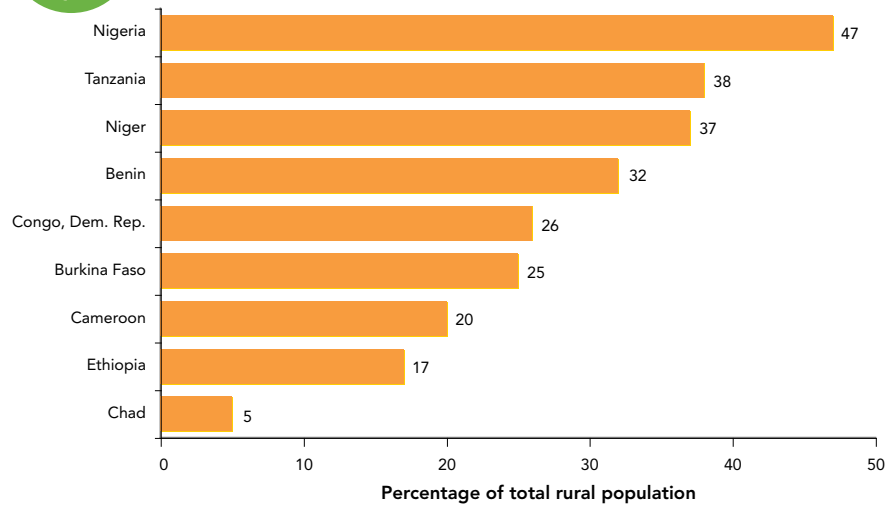
Road length, road density, and population density, selected countries



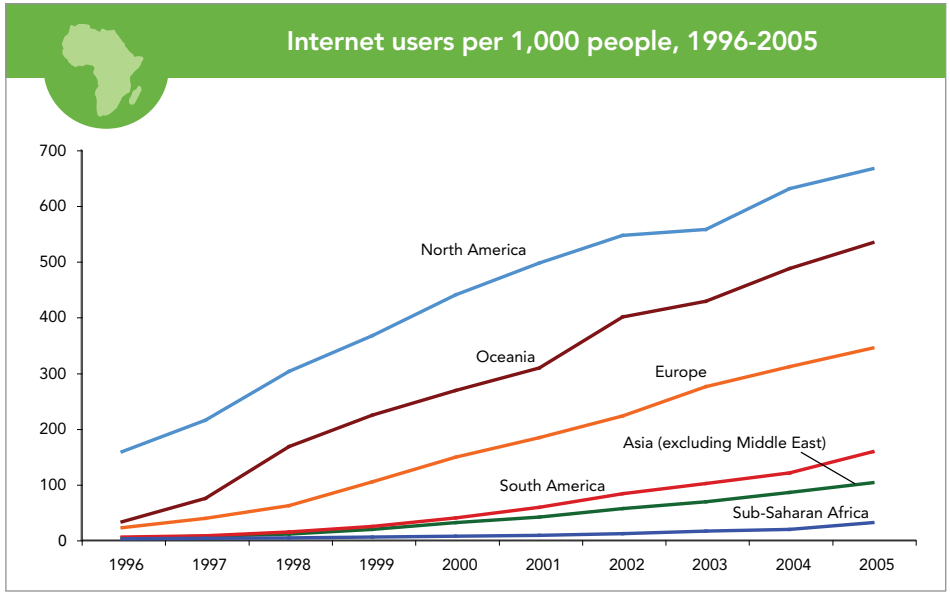
Source: World Bank, 2006.

Note: Size of the bubble: population density.

Rural population within 2 km of an all-season road 2000-2004



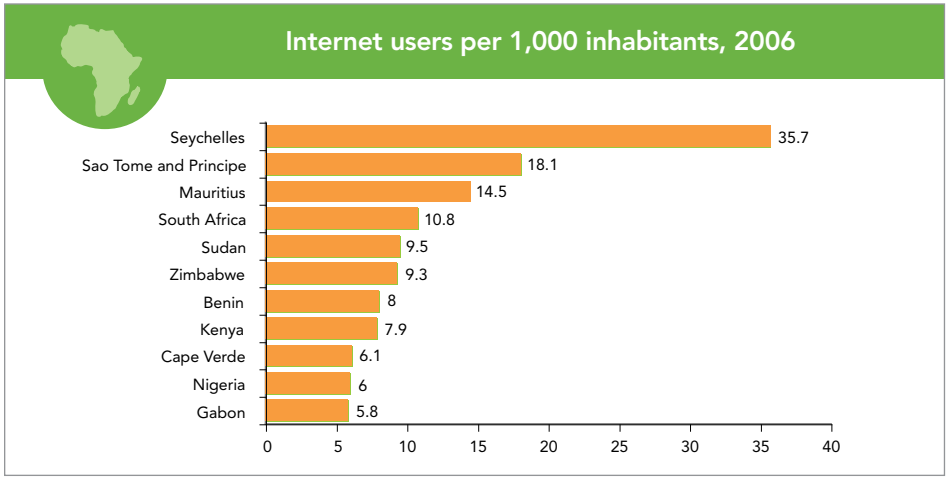
Source: World Bank, 2006.



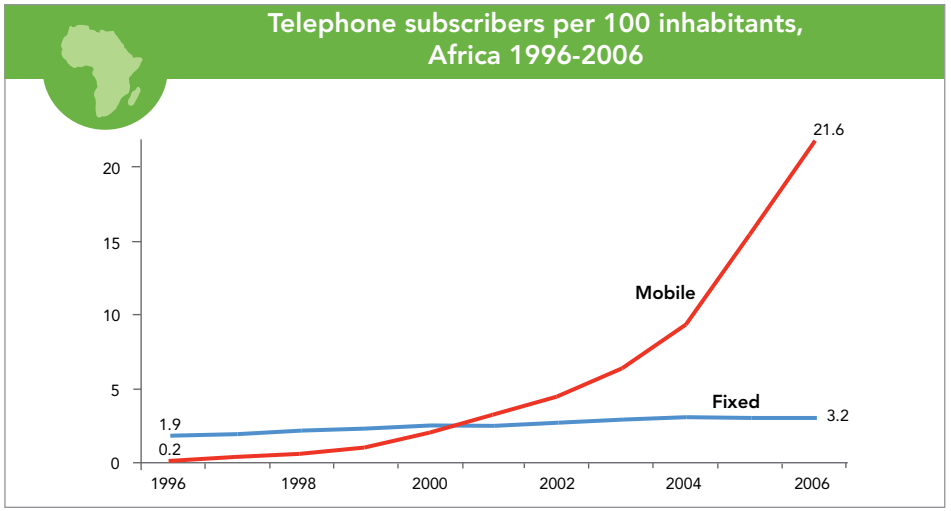
Source: ITU, 2007.

Access to information and communication technologies (ICT) is low but increasing rapidly.

In terms of access to ICT, sub-Saharan Africa has lagged behind the trends observed in other regions. Internet access rates are much lower in sub-Saharan Africa (1.3 subscriber per 1,000 people in 2006) than in Asia (4.8) and Oceania (29.3).[21]



Source: ITU, 2007.

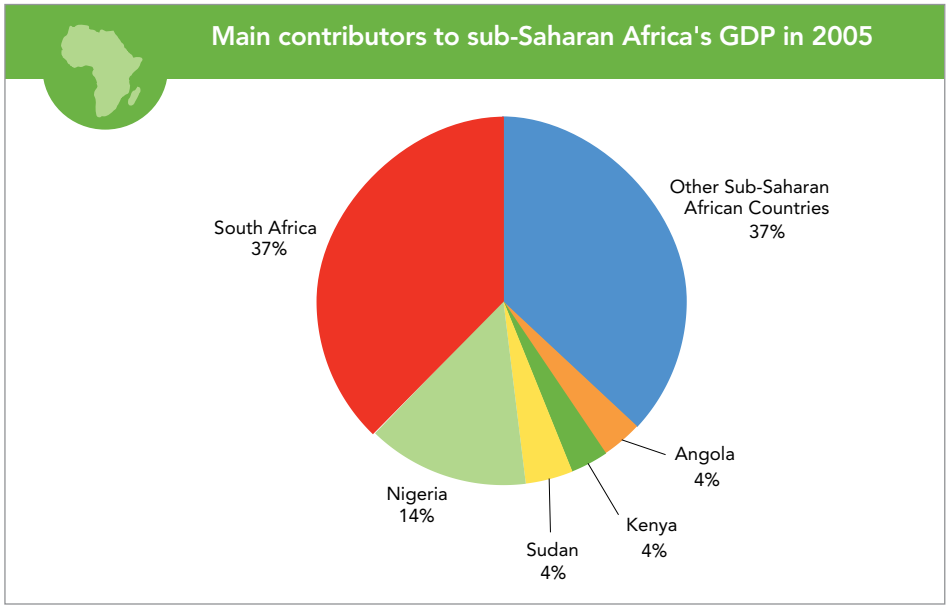


Source: ITU, 2007.

Mobile phones have taken off rapidly.

While telephone access is lower than in other parts of the world, with no countries registering more than 2 fixed telephone connections per 10 people, the landscape in ICT is changing quite rapidly in many countries, due to the extraordinarily fast uptake of mobile phones. The continent has the highest ratio of mobile to total telephone subscribers of any region and the highest mobile cellular growth rate. Growth over the past 5 years averaged around 50 per cent year on year. In Nigeria, the opening of the mobile market in 2001 has resulted in a massive increase in the number of subscribers, from 25,000 in 1999 to 32.3 million in 2006.[22] With mobile phones are associated innovative services like remote banking and other financial services as well as Internet access. This development of mobile phones represents one promising opportunity for development, mainly by allowing development of new business models to reach poor communities more efficiently.

STRUCTURE OF THE ECONOMY



Source: World Development Indicators 2007.

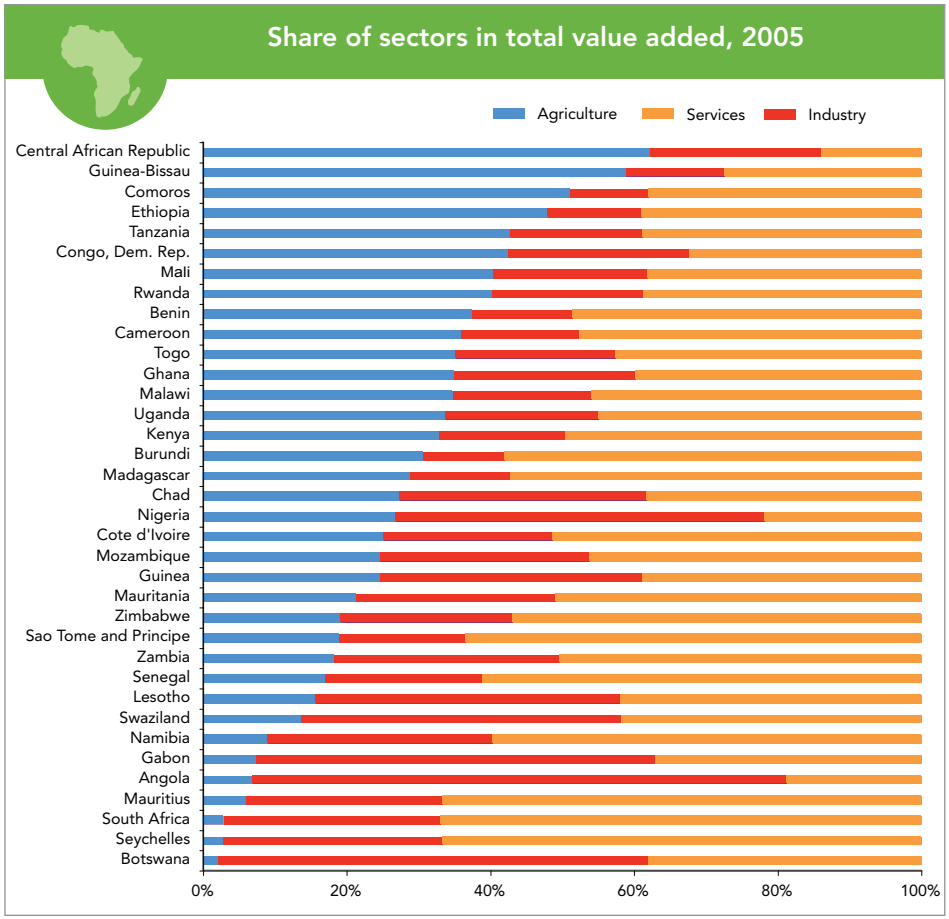
National economies are very diverse.

Some economies are still predominantly based on agriculture, including major African economies like Ethiopia. At the opposite end of the spectrum, agriculture represents less than 10 per cent of GDP in Botswana, Seychelles, South Africa, Mauritius, Angola, Gabon and Namibia.

Heavy dependence on primary commodities remains a common feature of production, exports and growth in all the subregions. The majority of African countries are dependent on oil and minerals or a limited range of agricultural commodities such as tea, coffee, cotton and cocoa. This exposes the continent to external shocks and makes economic diversification a top priority for growth policies on the continent.[23]

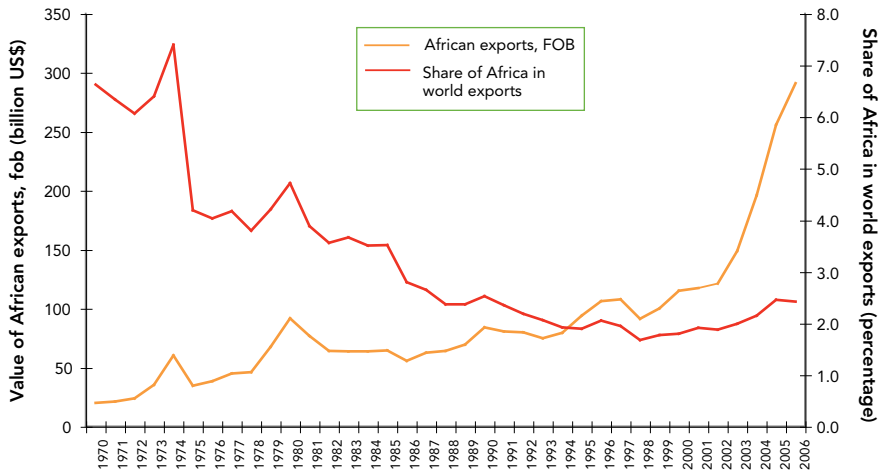
Nigeria and South Africa account for more than half of sub-Saharan Africa's GDP.

Economic figures for sub-Saharan Africa as a whole can be misleading, because averages often hide a high variability of situations and trends. This is accentuated by the fact that two economies, South Africa and Nigeria, represent more than half of sub-Saharan Africa's GDP. The prominence of these two countries has not changed significantly since 1990. South Africa's economy is largely dominated by services, which account for two thirds of GDP. Nigeria's, by contrast, is predominantly industrial, reflecting the importance of the oil and gas sector.



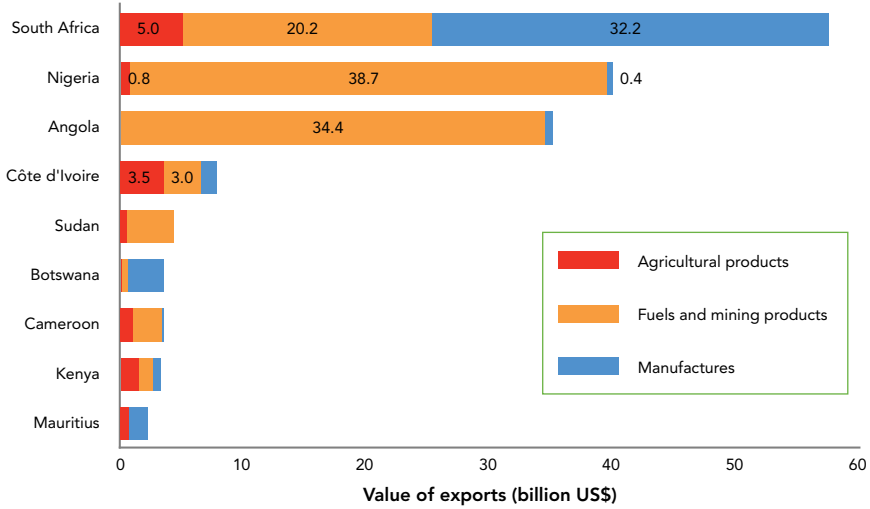
Source: World Development Indicators 2007.

Trends in African exports



Source: IMF, 2007.

Composition of exports, selected countries



Source: WTO Statistics Database, 2008.

Exports have increased sharply in the last years.

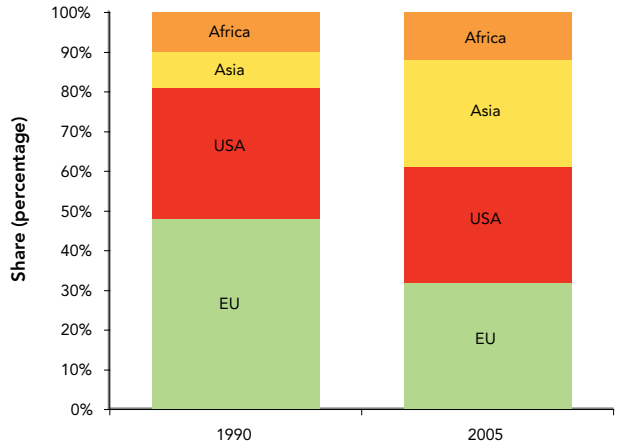
Africa's share of world exports had been declining for decades to 1.7 per cent in 1998, reflecting the increasingly marginal position of Africa in world commerce. The vigorous growth of African exports since 1998 seems to have reversed this secular trend.

> "The dramatic new trend in South-South economic relations is transforming traditional patterns of economic development, and this is nowhere more evident than in African-Asian trade and investment flows."
>
> Gobind Nankani
> Vice President for Africa
> the World Bank

South Africa aside, exports are highly dependent on raw materials.

Raw materials constitute more than 60 per cent of sub-Saharan Africa's total exports, second only to the Middle East and North Africa region. By contrast, the structure of exports in Latin America and Asia has become increasingly diversified from raw materials. In Asia, their share in total exports fell from 40 per cent in 1980 to less than 10 per cent today. In Latin America, the share fell from 55 per cent in 1980 to 40 per cent today.

Share of Africa's exports by destination

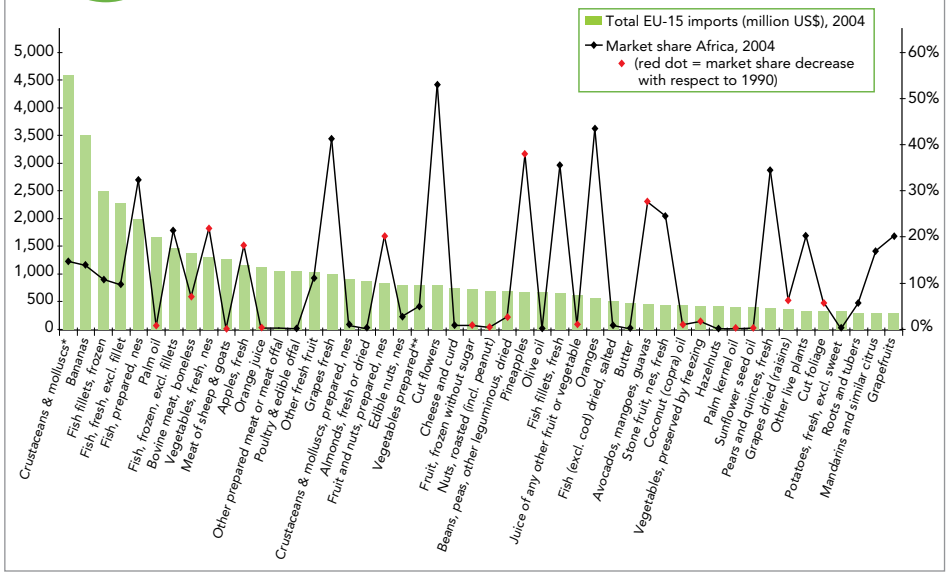


Source: World Bank, 2006.

Asia is rising as Africa's trade partner.

More than a quarter of African exports were headed to Asia in 2005, compared to only 9 per cent in 1990 and 14 per cent in 2000. The volume of trade between Africa and Asia is now almost on par with Africa's exports to the United States and the European Union, Africa's traditional trading partners. Since 2000 there has been a massive increase in trade and investment flows between Africa and Asia. Merchandise exports to China have grown by almost 50 per cent each year between 1999 and 2004, and at more than 10 per cent a year with India and the rest of Asia. Imports of merchandise from China and India have also grown very rapidly in recent years. This recent acceleration of commercial exchanges with India and China reflects the booming economies of the two Asian giants, which are accompanied by a search for raw materials, minerals and fuel. [24]

Africa's insertion in the EU-15 market for some high-value agricultural goods

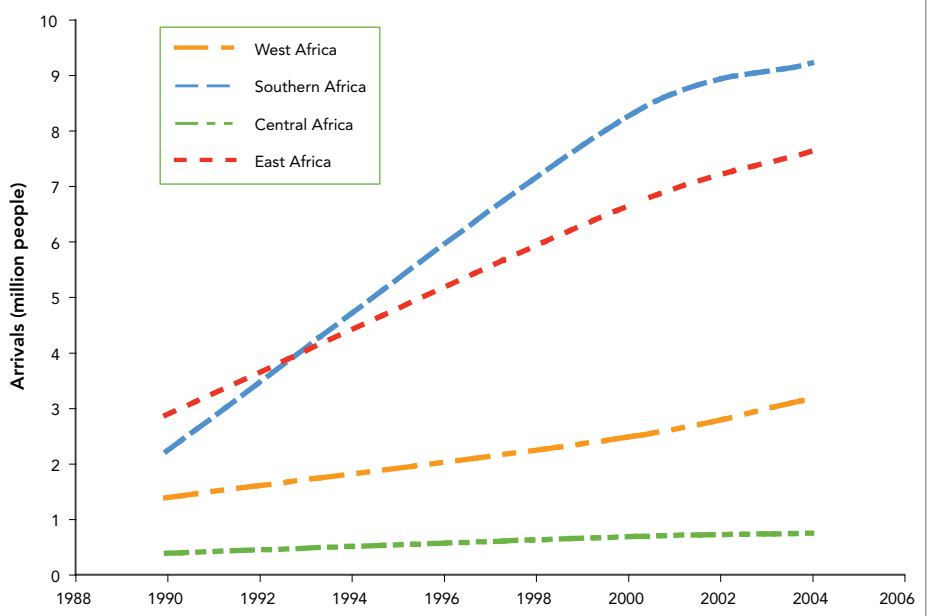


Source: United Nations, 2007.

Sub-Saharan Africa is still weakly integrated in high-value agricultural markets.

Sub-Saharan Africa's agricultural exports are concentrated in a few commodities (coffee, tea, cocoa, sugar, cotton, bananas). For almost half of the countries in sub-Saharan Africa, agricultural commodities are the main exports. For many of them, reliance on one single agricultural commodity reaches between 50 and 75 per cent of total commodity exports.[25] With the exception of cotton, over the last two decades African producers have steadily been losing market share to Asian and Latin American competitors. Non-tariff barriers such as sanitary and phytosanitary (SPS) standards will likely remain key obstacles for many African countries. Other supply-side constraints that have been identified as major bottlenecks in Africa include poorly funded research and development, relatively weak links to global supply chains, and poor logistics infrastructure to be able to deliver products at the price and in the volumes, quality and timing required by international buyers.

International tourist arrivals (millions)

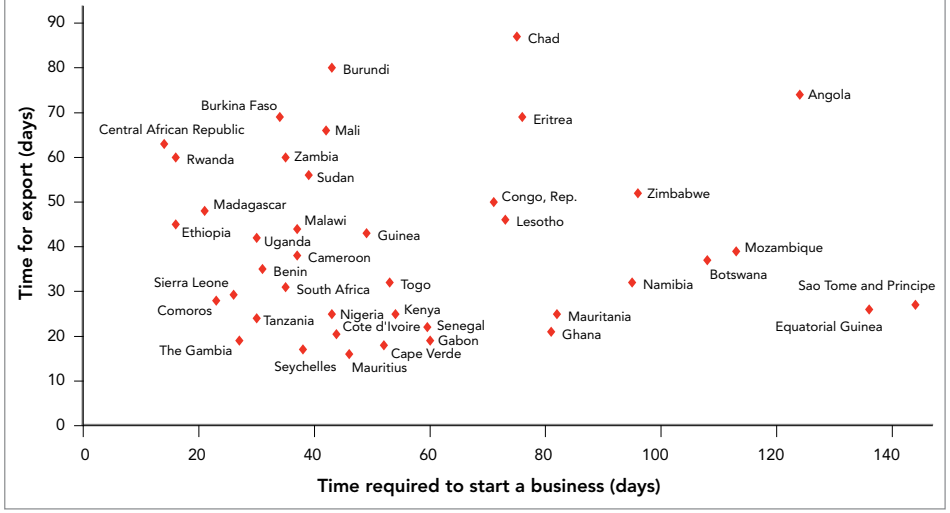


Source: ECA, 2007.

Tourism dominates services exports, both for the region overall and for several countries.

It also exhibits the fastest growth rate of services exports for the region. Tourism is a crucial source of foreign exchange for many countries, in some countries coming before the main agricultural commodities. In Ethiopia, tourism is the third-highest export earner, just after coffee and oil seeds.[26] In terms of earnings, South Africa is the most important tourist destination south of the Sahara, followed by Mauritius, the United Republic of Tanzania and Botswana.[27] There is great potential for further development of the industry in the region. The development of the tourism sector can provide an important source of employment. It could also bring positive spillover effects in terms of improved transportation, enhanced communications infrastructure, and transfers of technology, knowledge, and managerial skills.

Business climate: export delays and time to create a business

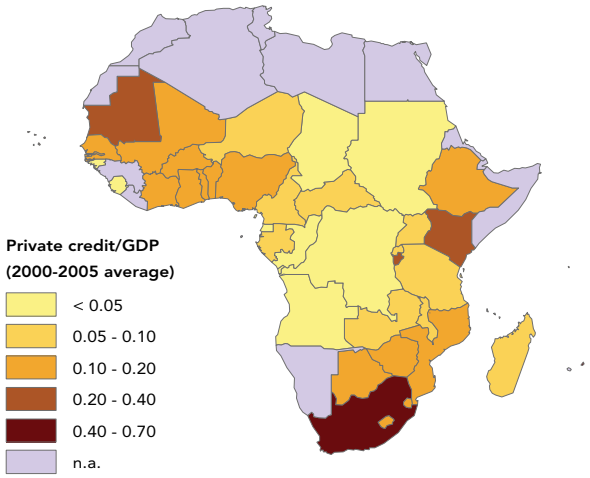


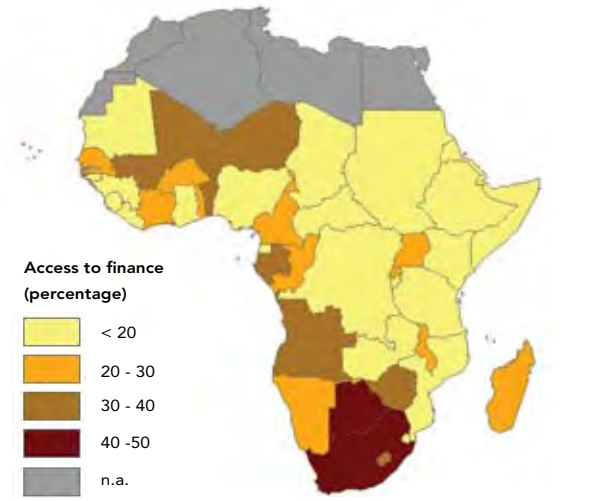
Source: World Development Indicators 2007 and AFDB, 2006.

The business climate tends to work against investment in many countries.

Time to start a business can be very long. The time for export also varies considerably across countries. While island countries or countries with coastal access like Seychelles, Cape Verde, Mauritius and the Gambia have relatively short times for export, landlocked countries like Chad, Burundi and Eritrea, as well as Burkina Faso and Angola, all register very long times for export.

Access to finance and private credit/GDP



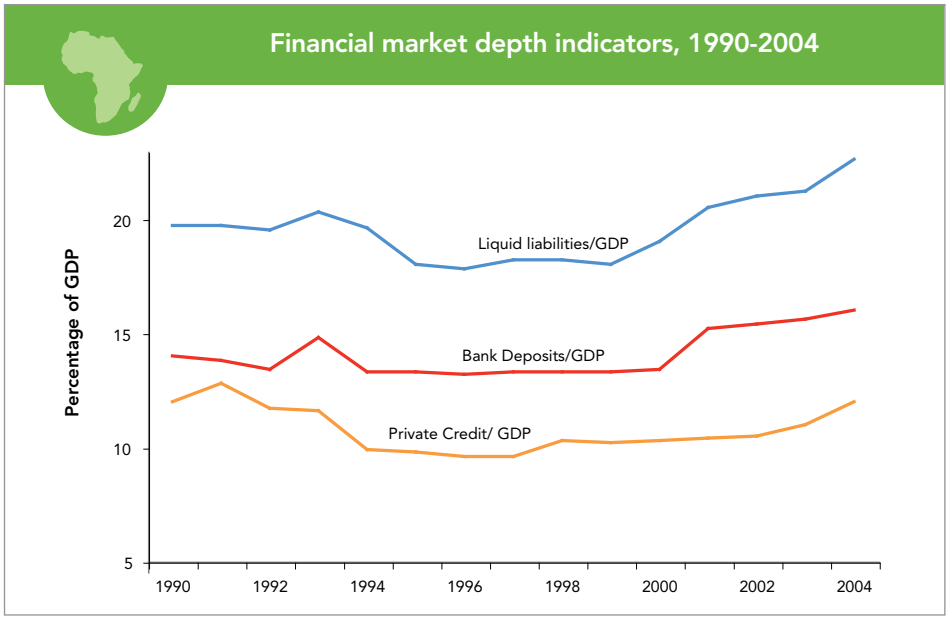


Source: World Bank, 2007.

The breadth and depth of financial systems remain weak in most countries.

In the majority of sub-Saharan African countries, it is estimated that less than 20 per cent of the adult population has access to formal sources of finance. Depth of financial systems, as seen through the ratio of private credit to GDP, is also weak compared to other developing countries. South Africa presents an exception, with fairly developed financial markets.[28]

Among the factors that contribute to low access rates are the low population densities and communications and transportation deficiencies. Most sub-Saharan African countries have lower branch and ATM penetration than developing countries in other regions. Affordability is another important barrier. Low levels of income and irregularity of income flows have tended to make large parts of the population "unbankable" in the eyes of traditional financial service providers.[29]



Source: World Development Indicators 2007 and AFDB, 2006.

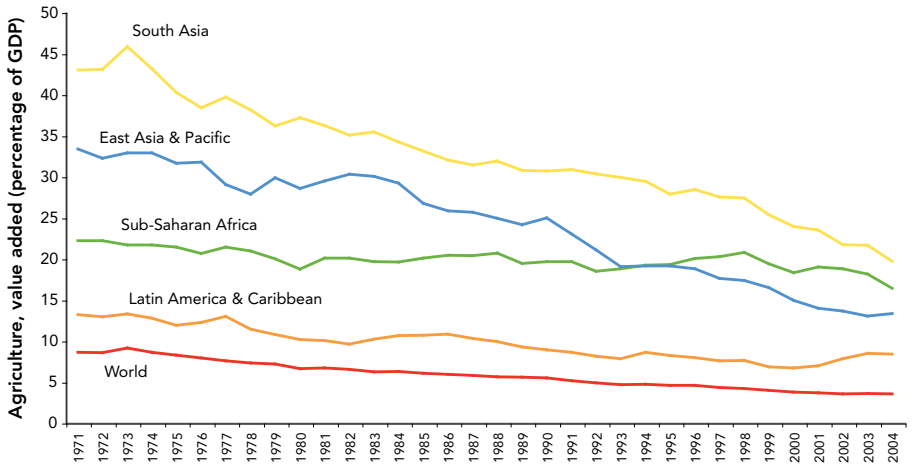
The recent years have witnessed a trend towards a deepening of financial markets, notably since 2000.

Recent technological advances, such as mobile branches or banking by mobile phone, have recently helped extend access. By contrast, African capital markets are still underdeveloped. The stock market capitalization of the whole continent is estimated at $800 billion, of which South Africa itself makes up $600 billion.

Regional or subregional integration of financial and capital markets is still weak. However, there are some encouraging trends. In 2001, the eight members of the West African Economic and Monetary Union (WAEMU) set up a regional treasury bill market. With all countries issuing securities, the market has been growing rapidly, boosted by tax and regulatory incentives. Cross-border sales of treasury bills among WAEMU countries point to a growing integration of financial markets in that region.[30]

AGRICULTURE

Trends of share of agriculture in GDP, 1971-2004



Source: World Development Indicators 2007.

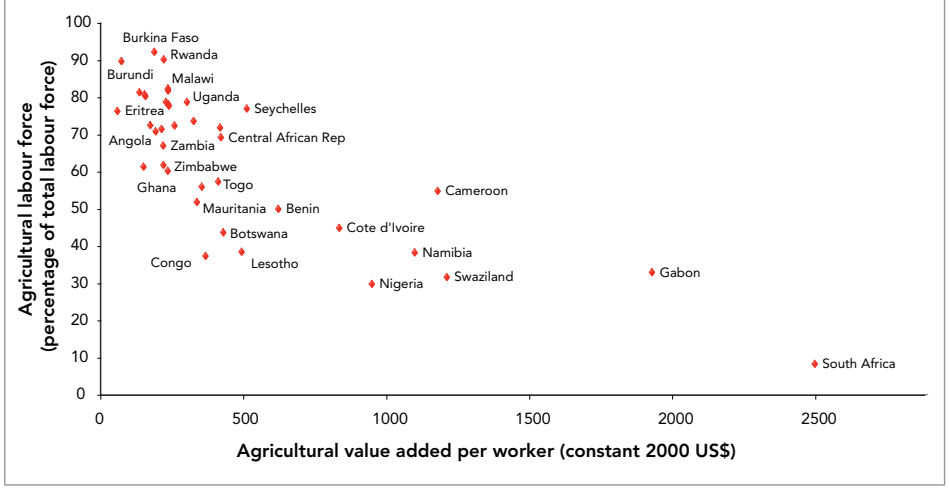
About 20 per cent of sub-Saharan Africa's GDP is generated by agriculture.

Agriculture still dominates the economy of many countries in the region. Although the economies of South and East Asia used to be more dependent on agriculture than Africa in the 1970s, the importance of agriculture has declined in both regions, whereas the share of agriculture in the sub-Saharan African economy has only slightly decreased.

In many countries, agriculture is the main source of employment.

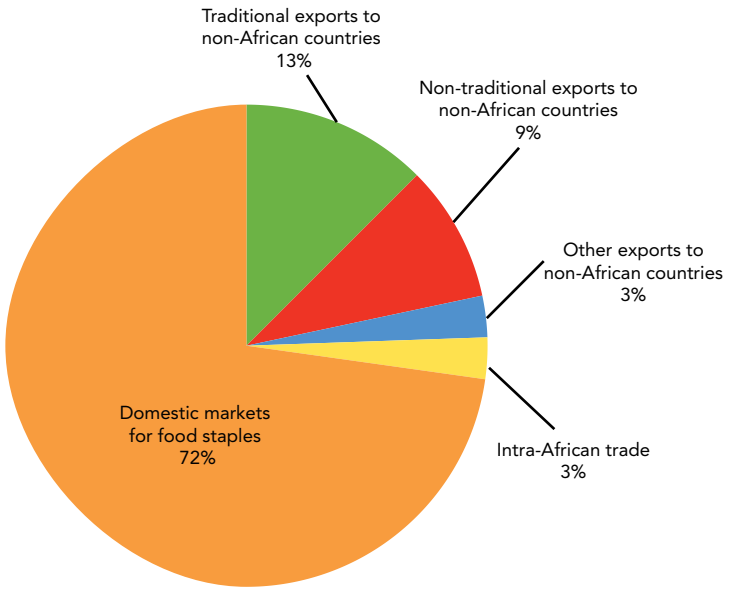
In at least 20 countries, more than 70 per cent of the labour force works in agriculture. Crop production and livestock husbandry account for about half of household income. The poorest members of society are those who are most dependent on agriculture for jobs and income. Average agricultural value added per worker is low in many countries, reflecting a low degree of mechanization and limited penetration of improved seeds and inputs such as fertilizers.

Agricultural labor force and agricultural productivity (2004)



Source: World Development Indicators 2007 and FAO 2007.

Destination and composition of agricultural trade, Sub-Saharan Africa (1996-2000 average)



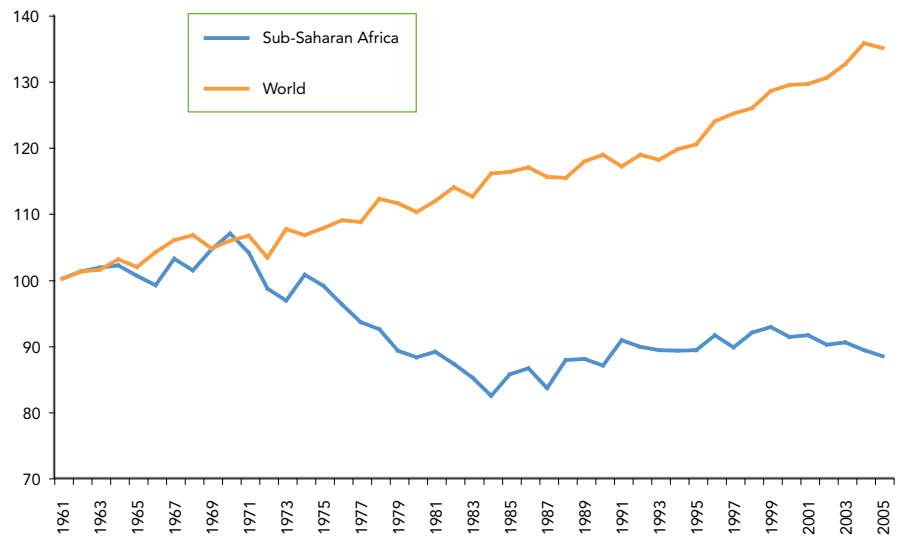
Source: IFPRI, 2007.

Agriculture is still largely oriented towards subsistence agriculture.

From a study undertaken by IFPRI on the years 1996-2000, for sub-Saharan Africa as a whole 72 per cent of the food traded was for sale in domestic markets for food staples. Traditional and non-traditional exports constituted only 22 per cent of total trade. Food trade between African countries is very limited. Southern Africa and in particular South Africa are more oriented towards exports than the other subregions. By contrast, in Eastern Africa 80 per cent of all food traded was for sale in domestic markets for food staples.[31]

> "Africa is the only region where overall food security and livelihoods are deteriorating. We will reverse this trend by working to create an environmentally sustainable, uniquely African Green Revolution. When our poorest farmers finally prosper, all of Africa will benefit."
>
> Kofi Annan
> former UN Secretary General

Food production index per capita, 1961 - 2005



Source: FAO, FAOSTAT, 2007.

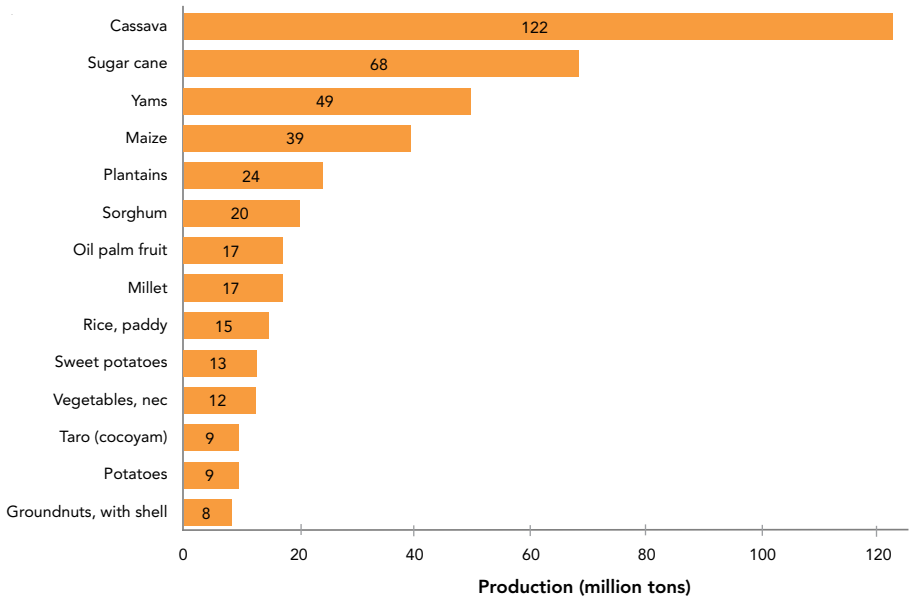
Note: Index base 100 in 1961.

Food production in most of sub-Saharan Africa has not kept pace with the population increase over the past four decades.

Sub-Saharan Africa is the one region where per capita food production is either in decline, or roughly constant at a level that is less than adequate.[32] In Africa as a whole, food consumption exceeded domestic production by 50 per cent in the drought-prone mid-1980s and more than 30 per cent in the mid-1990s.[33]

At the subregional level, during the last 15 years only Western Africa has succeeded in increasing per capita food production significantly. In Southern Africa, food production has declined and suffers from high variability, reflecting vulnerability to weather conditions of rain-fed agriculture in arid or semi-arid regions.

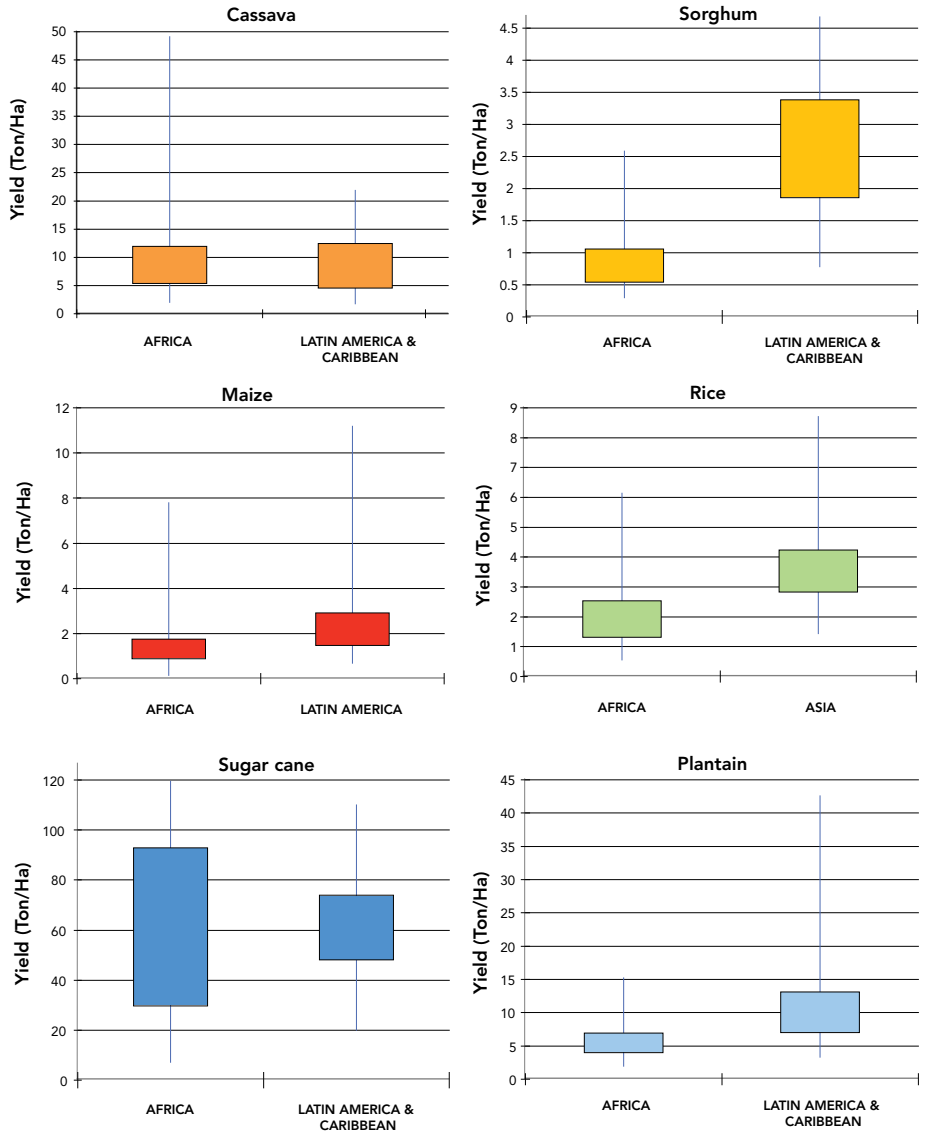
Commodities production, sub-Saharan Africa, 2006



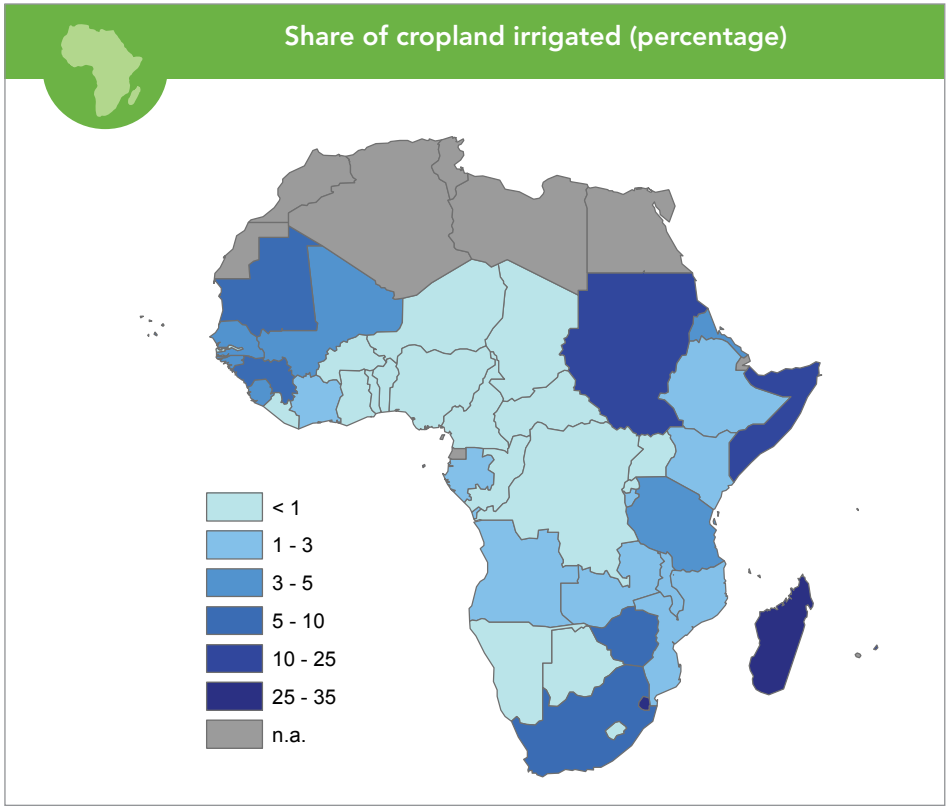
Source: FAO, FAOSTAT, 2007.

Africa's main commodities are cassava, sugar cane, yams and maize. Sorghum, plantain and rice are also important food staples. For all those commodities except sugar cane and sugar products, yields registered in Africa are generally lower than those registered in Latin America or Asia. Lower productivities in Africa result from a combination of factors, including: high dependence on rain-fed agriculture; low and declining soil fertility due to low levels of organic matter in the soil; lower use of improved seeds, fertilizers and other inputs than in other regions; relative fragmentation of land holdings; low level of mechanization; and low levels of access to credit for farmers.

Distribution of yields estimated at country level for selected commodities (2006)



Source: FAO, FAOSTAT, 2007.

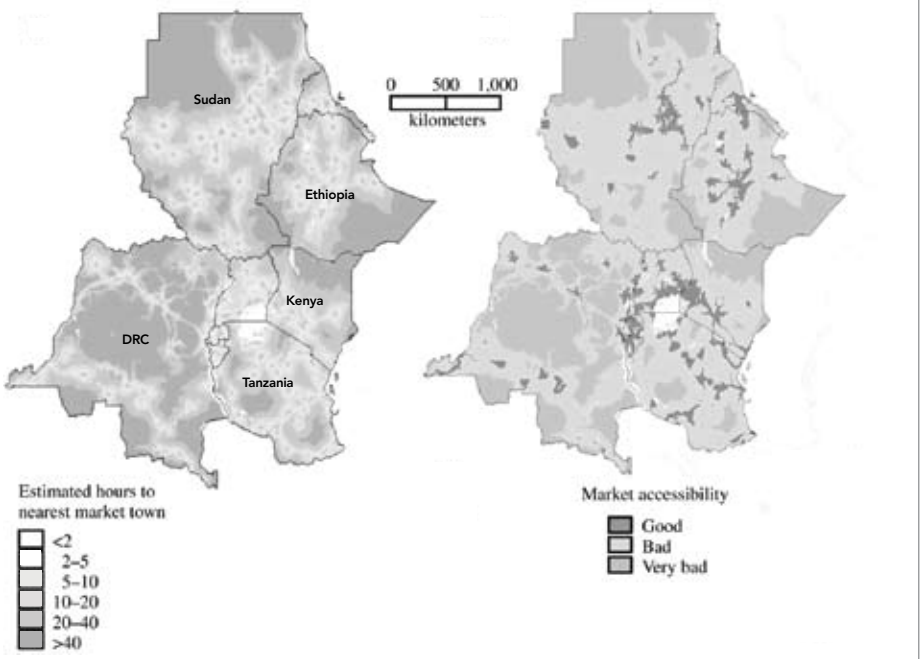


Source: FAO, FAOSTAT, 2007.

Compared to other regions, irrigation is much less developed in sub-Saharan Africa.

Only 4 per cent of agricultural land is currently under irrigation. In arid or semi-arid regions, lack of irrigation infrastructure constitutes a constraint to increases in productivity. Some parts of the continent have the potential for extending irrigation networks, due to large untapped endowments of water resources. In other parts of the continent, however, renewable water is limited and will come under greater pressure in the future due to population increase. There, agricultural demand for water will compete with increasing demands for domestic and industrial purposes. Integrated water resource management approaches, which have been adopted by an increasing number of countries, will be needed to allocate water efficiently.

Agricultural market access in Eastern Africa: travel times to regional market centres and aggregate high/low market access classes

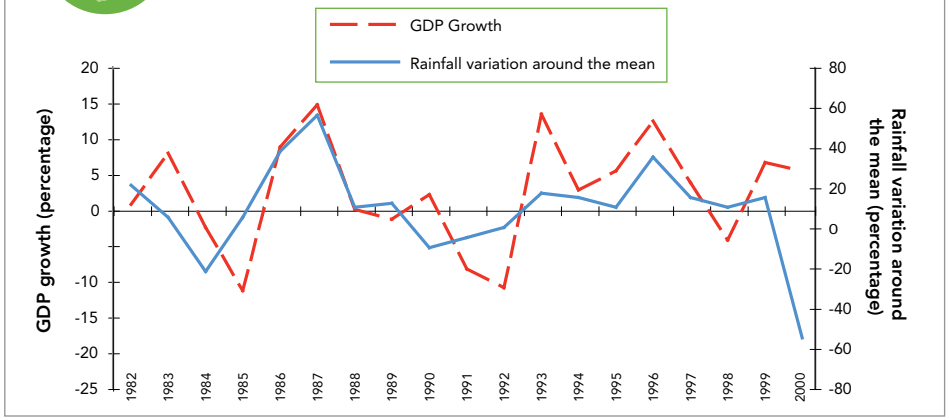


Source: IFPRI, 2006.

Lack of access to markets constitutes a binding constraint to the agricultural sector in most of the continent.

According to a study on Eastern and Central African countries done by IFPRI, transport costs and other internal trade barriers such as marketing cost have a major impact on agricultural GDP. Improving transport infrastructure looks to be critical to allow for linkage of rural areas with urban markets, and to allow for production of products aimed at export markets that need to reach borders within limited time. Well-functioning transport networks are also key as a protection against local weather shocks in order to allow for easy food transfers between surplus and deficit regions.[34]

Rainfall variability and GDP growth in Ethiopia



Source: World Bank, 2006.

Rainfall variability deeply affects many economies that are largely dependent on rain-fed agriculture.

In addition to direct impacts on agricultural output, rainfall variability also affects transport, power production and water-intensive industry. Ethiopia is an extreme example of such dependence of the whole economy on rain. According to a World Bank study, incorporating historical rainfall variability into a model of the Ethiopian economy decreases projected GDP growth rates by 25 to 40 per cent, compared to projections from models based on average rainfall.[35]

Devising risk mitigation and adaptation strategies well integrated into economic planning is critical to addressing vulnerability to weather in many African countries. Examples of such strategies already put in place include early warning and response systems for drought (Ethiopia); an integrated flood management system in Mozambique; dissemination of meteorological information and incorporation into farmer's practices (choice of crops, decisions to sow etc.) in Mali;[36] and the introduction of index-based weather insurance products for farmers in Malawi.[37]

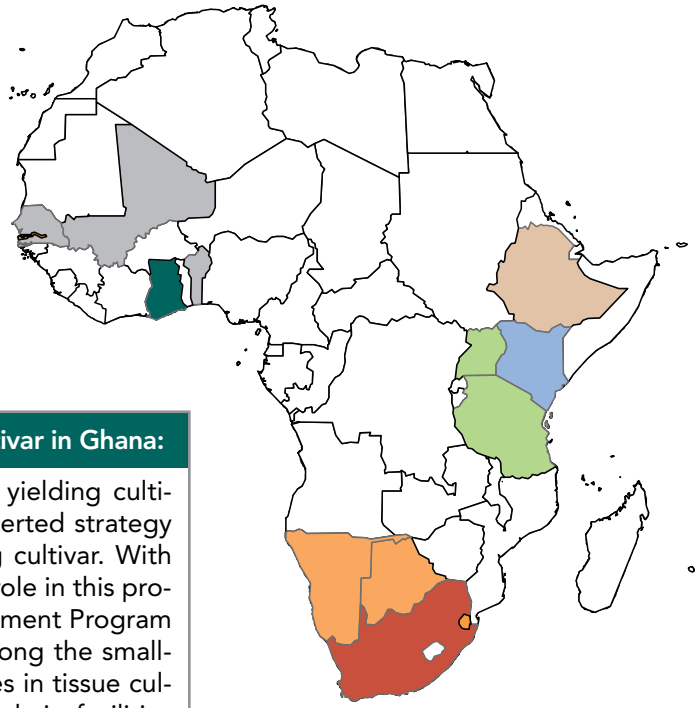
High value agricultural exports from Africa

Trademarking of specialty coffee in Ethiopia:

The producer share of retail prices of agricultural commodities has systematically declined during the last three decades, at the same time as consumer prices in developed country markets for coffee, and especially specialty coffees, have increased substantially. Obtaining trademarks for coffee grown in Harar, Yirgacheffe, and Sidamo allows Ethiopia to decide which distributors it will grant licenses to sell those specialty coffees, and under what terms. This will allow growers to retain a higher share of the profits.

Organic cotton in West and East Africa:

Some smallholder farmers in West and East Africa are turning to organic production. Organic cotton production began in Uganda and Tanzania in 1994, in Senegal in 1995, and in Benin and Mali in 1996, but adoption has been slow, despite higher returns and lower production costs. High certification costs and the fact that yields typically drop until efforts to improve soil fertility and integrated pest control measures bear fruit are important barriers to adoption.



Fish fillet industry in Uganda and Tanzania:

Investments in quality and food safety assurance systems are key factors behind Uganda and Tanzania's emergence as important suppliers of fish fillets — a high unit value export that happens to be among the most dynamic commodities in world trade. Production of fish fillets has stimulated the development of the animal feed sector, which uses fish waste as a main input, as well as the packing and logistics sectors.

Overexploitation of fisheries stocks, however, could limit the industry's expansion. Product differentiation could also be improved. Nile Perch from Lake Victoria is still sold in developed country markets without any reference to its origin and characteristics.

Smallholder conversion to higher yielding pineapple cultivar in Ghana:

Confronted with increasing competition from a higher yielding cultivar grown in Costa Rica, Ghana has put in place a concerted strategy to convert pineapple production to the higher yielding cultivar. With donor support, the government is playing an important role in this process through its Agricultural Services Support and Investment Program (AgSSIP). In addition to supporting crop conversion among the smallholders, other actions include developing local capacities in tissue culture multiplication techniques and investments in cold-chain facilities and other export infrastructure.

Cut flowers and fresh vegetable exports from Kenya:

Kenya is the largest exporter of fresh vegetables in sub-Saharan Africa and its market share in the EU is second only to Morocco. In addition, the country is by far the largest exporter of cut flowers in Africa and one of the largest in the world.

Public investments in logistics infrastructure for air-freighted perishable exports and in quality and food safety assurance systems have been instrumental to Kenya's export diversification success, helping to attract private sector investment.

Substantial private investments have been undertaken by the leading companies in the fresh produce industry, stimulated by a liberal investment regime, and fiscal incentives for horticultural exports.

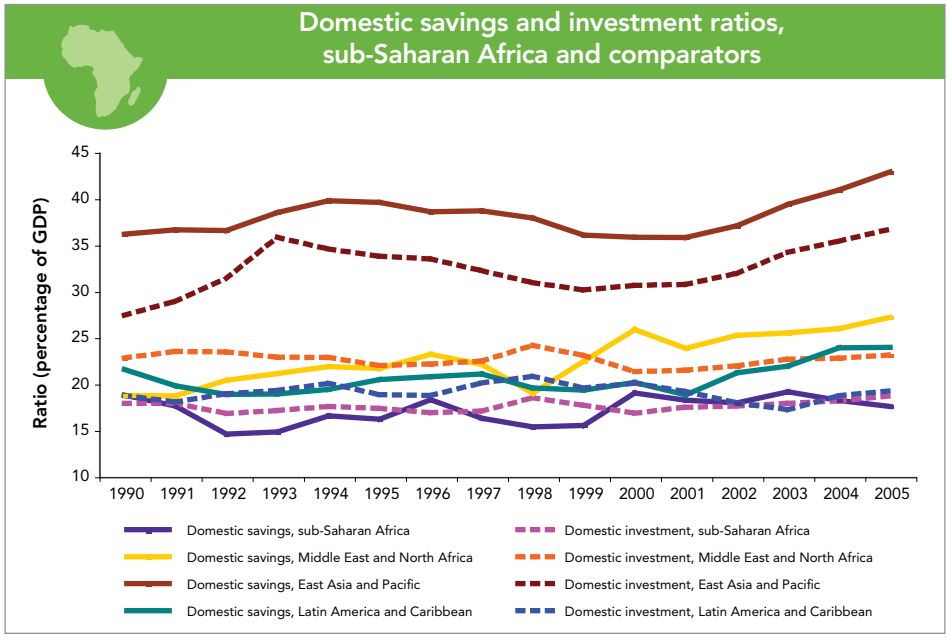
South Africa citrus and supply chain organization:

In addition to investments in productivity and quality, suppliers must now undertake important investments in terms of organization if they want to penetrate international markets. South African citrus agribusinesses are among the few on the continent which have been engaged in forging alliances with international partners in the United States and elsewhere.

Traceability and differentiation in beef from Namibia vs. Botswana:

Namibia and Botswana are the largest African (boneless) beef exporters to the EU. To be able to face competition from Brazil and Argentina, both countries have undertaken substantial public investments in order to meet stringent import requirements.

Namibia's market share in the EU has grown faster than Botswana's and unit values have also increased more. A key determinant of Namibia's success has been the Farm Assured Namibian Meat Scheme, managed by the government-owned, privately financed Meat Board of Namibia. Under this scheme, both full traceability and strict veterinary and animal welfare standards conforming to EU requirements are ensured. No other comparable scheme exists in Africa today.



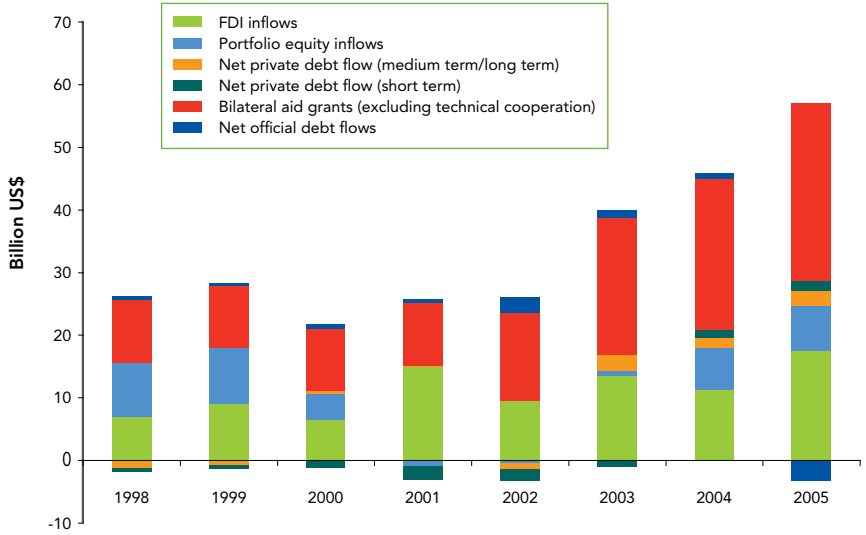
Source: World Development Indicators 2007.

Domestic savings and investment remain low.

Relative to developing countries in Asia and Latin America, sub-Saharan Africa has the lowest investment ratios.[38] Over the period 2000-2005, domestic investment as a proportion of GDP remained stable at 18 per cent in sub-Saharan Africa, while growing from 30 to 36 per cent in East Asia and the Pacific. Low savings are a main factor for the observed low investment rate in the region. Over the period 2000-2005, domestic savings as a proportion of GDP were 17 per cent in sub-Saharan Africa and 26 per cent in the Middle East and North Africa. In East Asia and the Pacific, they reached more than 40 per cent at the end of the period. There are wide differences in savings patterns across countries. Botswana, the Congo, Gabon and Nigeria have savings rates greater than 30 per cent. The majority (28 countries) of the remaining countries in the region for which data are available have positive but low savings ratios. Eleven countries had negative savings rates over the period 2000-2004.

> "African countries need to mobilize domestic resources, and receive the support promised by development partners. In some areas, particularly in infrastructure, the private sector can provide important co-financing."
>
> Ban Ki-moon
> UN Secretary-General, 2008

Sources of external finance in sub-Saharan Africa

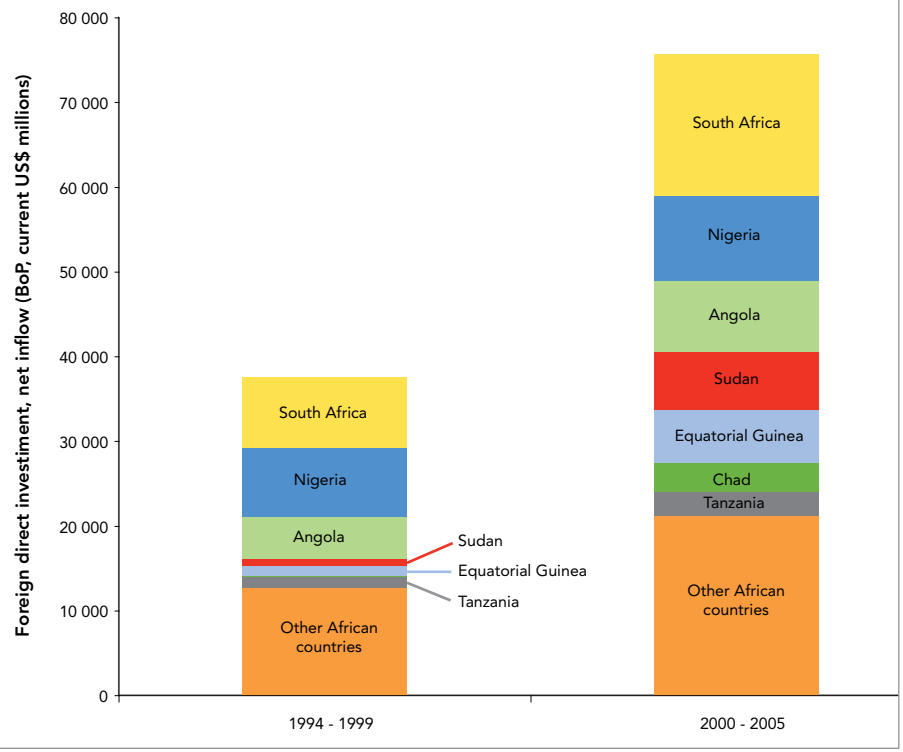


Source: World Bank, Global Development Finance 2006.

External resources are crucially important in financing development in the region.

In recent years, the importance of private capital flows has been comparable to that of official flows. However, the former tend to be more volatile as well as concentrated in a few countries in the region. A large part of private capital flows are in the form of equity, as opposed to debt. In fact, between 1998 and 2002 net private debt flows to the region were negative. This decline in debt was accompanied by a shift from short- to medium- and long-term debt. In turn, a large part of the net equity flows to the region has taken the form of foreign direct investment (FDI), as opposed to portfolio equity inflows. The latter have shown a great deal of volatility, reflecting sudden changes in investors' perceptions of risks and returns. Aggregate FDI flows have shown less volatility and more than doubled from 1998 to 2005. However, the region as a whole, with an estimated $17.6 billion FDI flow in 2005, still attracts less FDI than many individual developing countries.[39]

FDI to Africa by destination, 1994-2005

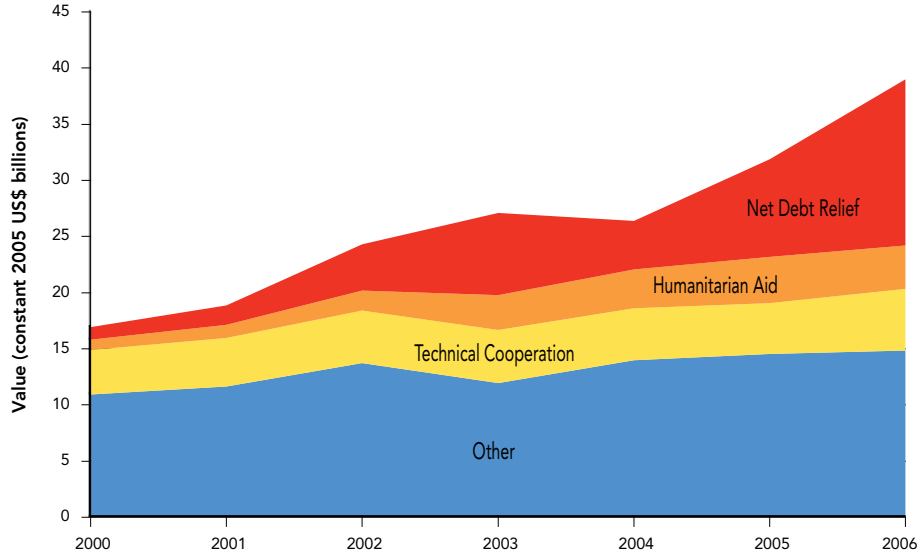


Source: World Development Indicators 2007.

In the last decade, the bulk of FDI has been concentrated on a handful of countries.

South Africa, Nigeria and Angola alone have represented about half of total net FDI from 1994 to 2005. A large proportion of FDI goes to the oil sector. Over the last 15 years, 70 per cent of FDI has been invested in five out of the seven African oil-exporting countries as well as in South Africa. European and North American countries have been the main foreign investors in sub-Saharan Africa. However, FDI from developing countries, particularly from South Africa, China and India, as well as from Malaysia and Brazil, has increased substantially.[40]

Components of total net ODA to sub-Saharan Africa, 2000-2006

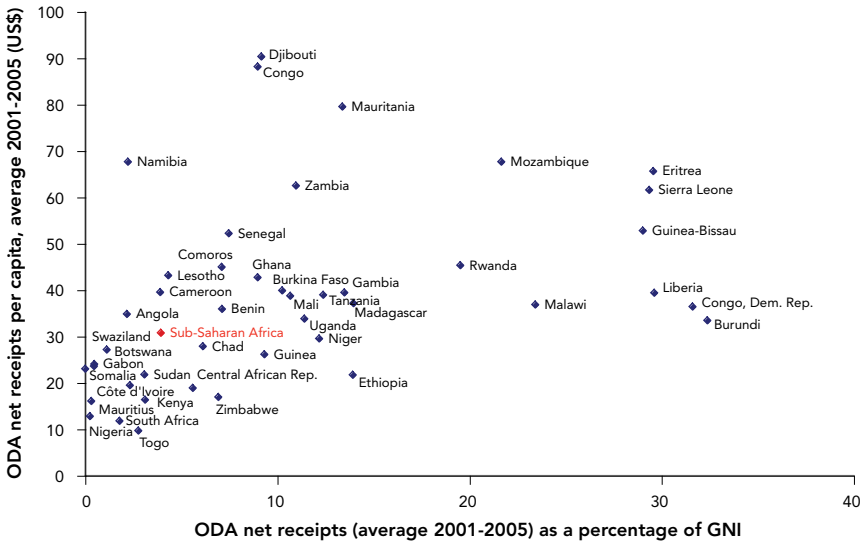


Source: OECD, 2008.

Aid has grown, but needs to be increased to meet agreed targets.

Since the beginning of the century, the continent has benefited from substantial inflows of official development assistance (ODA). After the Millennium Summit, numerous high-level international initiatives have put a renewed emphasis on the need for developed countries to substantially increase aid for sub-Saharan Africa. At that Summit, developed countries also agreed to roughly double ODA flows to Africa in 2010 compared to 2000. A substantial part of the increase in aid flows in the most recent years has come from debt relief. Aid other than debt relief should increase in coming years if commitments to double aid to Africa are to take effect.[41]

ODA, national income and population

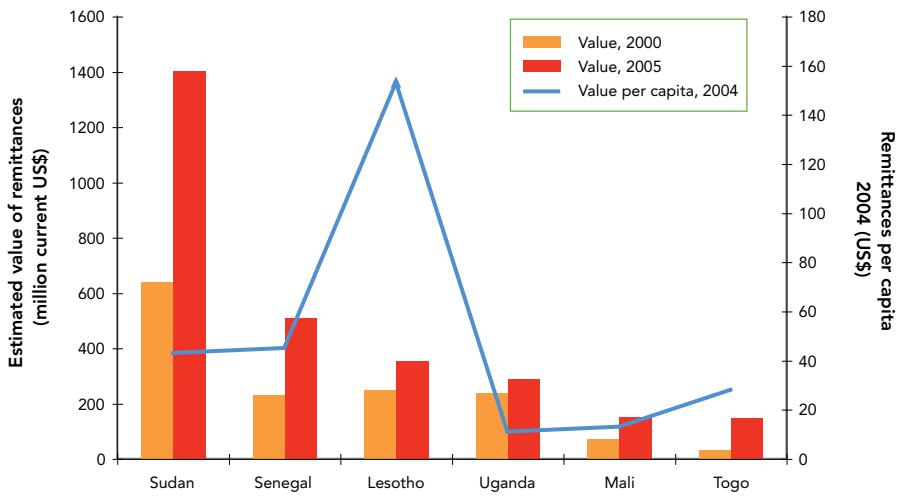


Source: OECD, 2007.

ODA receipts across African countries show a wide variability.

When calculated on a per capita basis or compared to countries' national incomes, ODA receipts vary widely across sub-Saharan African countries. Between 2001 and 2005, net ODA receipts for sub-Saharan Africa (including regional aid) represented about 4 per cent of GNI, or slightly under US$ 31 per capita. ODA receipts have represented more than 30 per cent of GNI in countries recovering from wars such as Burundi, the Democratic Republic of the Congo, Eritrea, Liberia and Sierra Leone. By contrast, ODA flows have represented less than 1 per cent of national income in countries such as South Africa, Mauritius, Gabon, Côte d'Ivoire and Botswana.

Values of remittances and remittances per capita, selected African LDCs

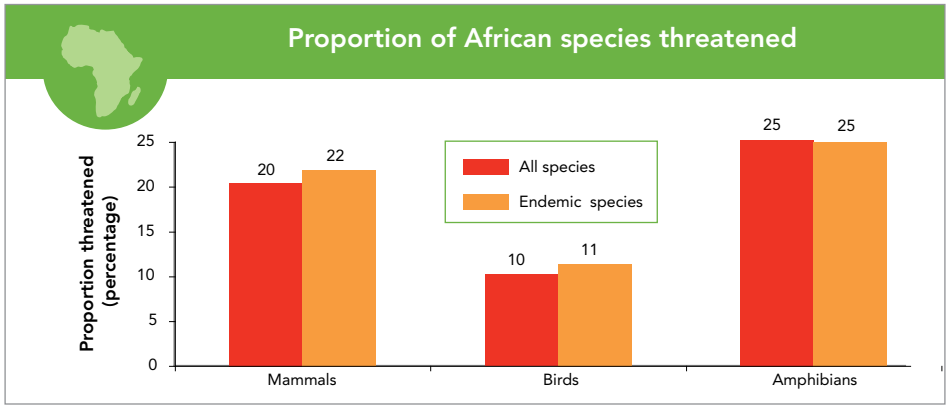


Source: UNCTAD, 2007.

Note: Remittance data need to be interpreted with care, given that the reliability of coverage appears to differ significantly between countries as well as for individual countries from year to year.

Remittances are an important contributor to sub-Saharan Africa's economies.

Although still less important than in the Middle East, North Africa and Asia, remittance flows have grown steadily over time and it is estimated that they account for at least 1.5 per cent of sub-Saharan Africa's GDP.[42] For individual countries, especially those with high out-migration rates, remittance flows are central to the economy. For some countries, remittances per capita are of the same order of magnitude as ODA.[43] Remittances can stimulate consumption and investment in receiving countries, help relax foreign exchange constraints and contribute to poverty alleviation. Their contribution to development, however, is still not well known, although there is evidence that they are more directed to consumption than investment.



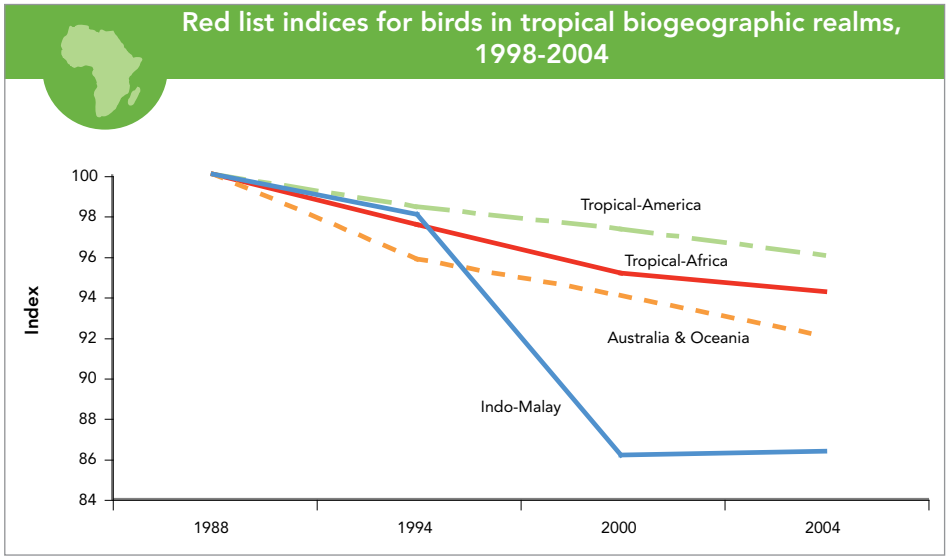
Source: IUCN, 2004.

Africa's large and diverse biological heritage is at risk in all subregions.

About 20 per cent of mammal species, 10 per cent of bird species and 25 per cent of amphibian species are classified as threatened by the World Conservation Union. Available trends show that biodiversity loss is continuing, although not faster than in other regions of the world. Among the main causes of biodiversity loss are land-use change, overexploitation of natural resources, pollution of ecosystems and the introduction of exotic species. Climate change is now considered as a main threat for biodiversity and natural ecosystems in the future. Changes in temperature and rainfall could cause high rates of species loss in specific biomes such as high mountain ecosystems and boreal ecosystems such as the succulent Karoo in South Africa.[44]

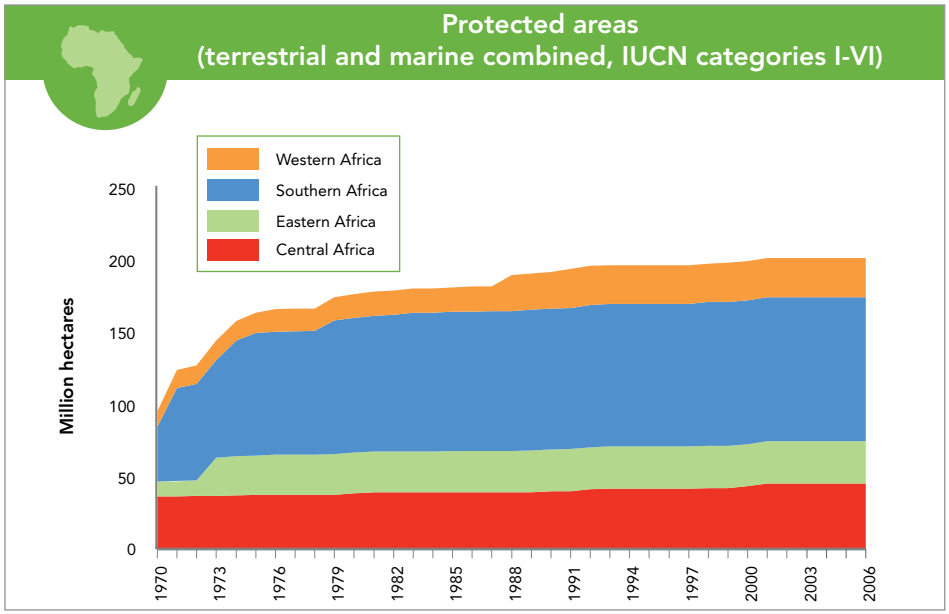
Sub-Saharan Africa has more than 2 million square kilometres of protected areas (terrestrial and marine).

From less than 500,000 km2 in 1950, protected areas have increased rapidly until the late 1970s, and at a slower pace since. Whereas at the global level terrestrial protected areas now cover 12 per cent of the land area, thus meeting the physical target of the Parties to the United Nations Convention on Biodiversity, in many officially protected areas effective protection of the ecosystems and biodiversity remains a concern, due to inadequate protection funding. Only about 0.6 per cent of marine areas are protected.[45]

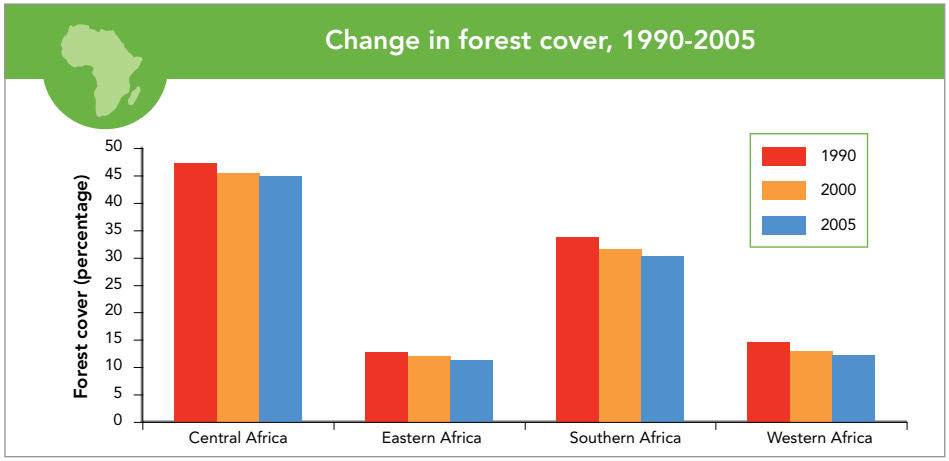


Source: Millennium Ecosystem Assessment, 2005.

Note: Red List Indices are based on the number of species in each Red List category, and on the number changing categories between assessments as a result of genuine improvement or deterioration in status. Decreasing values over time indicate loss of species richness.



Source: UNEP-WCMC, GeoData portal, 2007.



Source: FAO, 2006.

Between 1990 and 2005, sub-Saharan Africa lost an estimated 47 million hectares of forest.[46]

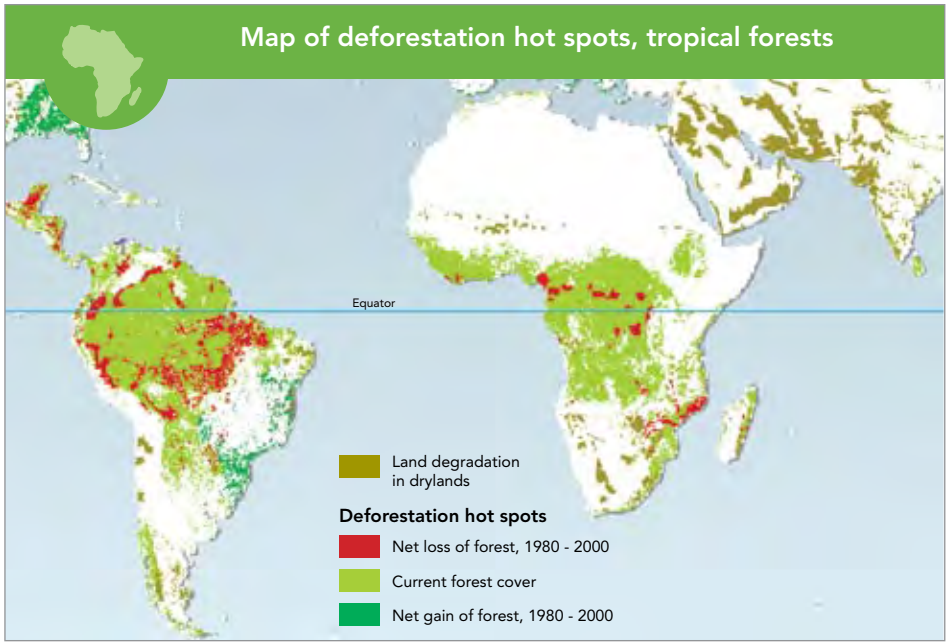
The forests of Africa are largely concentrated in the tropical zones of Western and Central, Eastern and Southern Africa. With more than 133 million hectares of forests, the Democratic Republic of the Congo alone has more than 25 per cent of the region's forest cover.[47]

Forests play an important economic role in many countries, by providing ecosystem services for resident populations as well as being a source of food and other non-timber products.

Between 1990 and 2005, the annual rate of deforestation in the region was about 0.7 per cent, with broad differences between countries. According to FAO statistics, Burundi, Togo and Nigeria lost more than 30 per cent of their forested areas during that period.

Logging roads are rapidly expanding in the Congo rainforest.

In large tracks of unexploited forest, deforestation tends to progress along transport routes. Road density in the Central African rainforest has increased dramatically since the 1970s, as evidenced by satellite imagery. The highest logging road densities are in Cameroon and Equatorial Guinea, while the most rapidly changing area is in northern Congo, where the rate of road construction more than quadrupled between 1976 and 2003. Out of about 10 million square kilometres of Central African rainforest, more than 600,000 square kilometres of forest are presently under logging concessions, while 12 per cent of the area is protected.[48]



Source: Millennium Ecosystem Assessment, 2005.

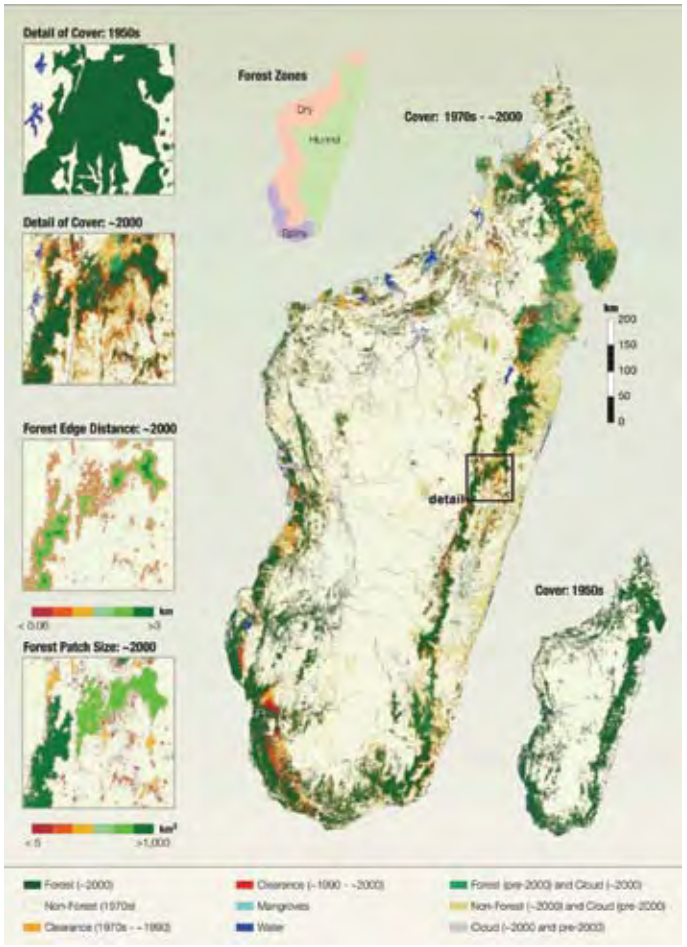
Deforestation is cause for concern in parts of the continent.

Although at the continent scale deforestation has been less intense than in Latin America, some areas in Africa are among the global hotspots for deforestation. This is the case of the Congo forest, but also of forest on the eastern coast of Southern Africa, as well as in Madagascar. Industrial logging in Central Africa is the most extensive land use, and the clearing of these forests could significantly increase carbon emissions.

Central African rainforest road. Photo by Nadine Laporte.

Road constructed through swamp forest to reach the Loudougou concession in northern Congo. Photo by Nadine Laporte.

Forest cover of Madagascar, 1950s - 2000

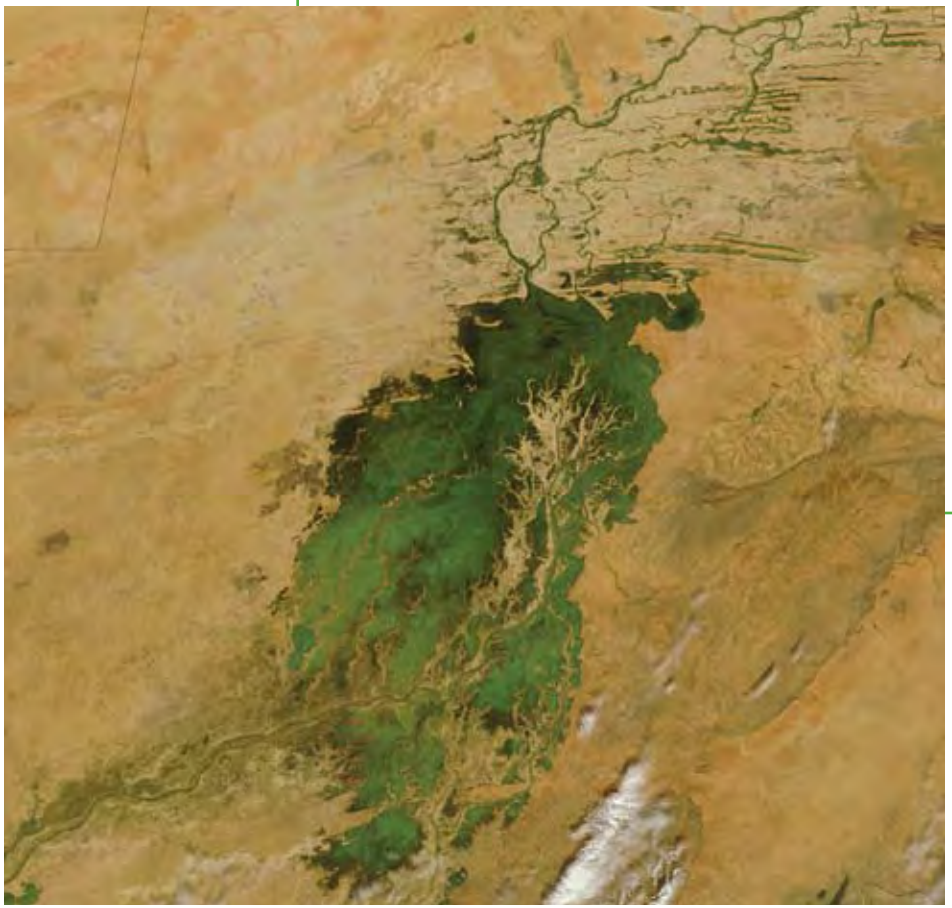


Source: United States Government, 2007.

Note: Forest cover changes from the 1970s to circa 2000 are shown in the main figure. Forest cover in the 1950s is shown in the lower right inset. Boxes on the left show forest cover as well as forest near edges and in isolated patches. The bioclimatic zones used for reporting cover and rates of change are provided in the Forest Zones inset.

Madagascar is a biodiversity hot spot, with a high proportion of endemic species.

However, much of the island's biodiversity is under threat from human pressure, in particular deforestation. Madagascar's forest cover decreased substantially over the last 50 years, from 27 per cent of the island in the 1950s to only 16 per cent circa 2000. Taking the fragmentation of forests into consideration, the decrease was even more drastic. From the 1950s to 2000, the area of interior forest more than 1 km from a non-forest edge decreased from 90,000 km^2 to less than 20,000 km^2, and the area in patches of greater than 100 km^2 decreased by more than half.[49]



Source: NASA, 2008

The Inner Niger Delta, Mali, seen from space.

Water scarcity will increase in many countries.

Although some African countries have high annual averages of available water per capita, many others already or soon will face water stress (1,700 m3 or less per person annually) or scarcity conditions (1,000 m^3 or less per person annually). Currently, 14 countries in Africa are subject to water stress or water scarcity. A further 11 countries will join them in the next 25 years.[50]

The Great Lakes region, seen from space.

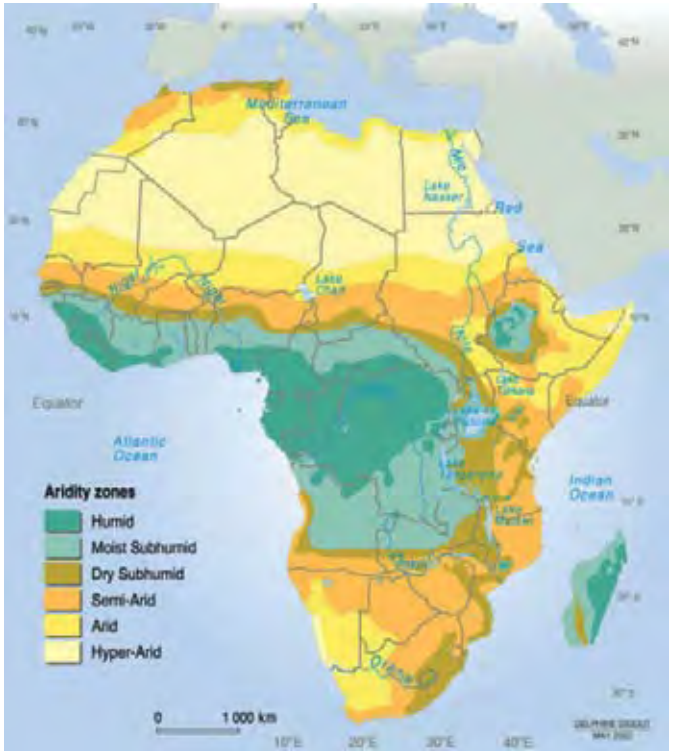
Source: NASA, 2008

Increased water scarcity in the future in many countries of the region implies a need for efficient management of shared water resources.

Africa's main rivers, the Nile, the Congo and the Niger, or their tributaries, as well as Africa's main lakes (Lake Chad, Lake Victoria and Lake Tanganyika), are shared by many countries. Regional cooperation on river basin management has gained momentum recently. The Nile Basin Initiative (NBI), originally designed in 1999 as a way to share scientific information, today brings together ministers from the basin countries "to achieve sustainable socio-economic development through equitable utilization of, and benefit from, the common Nile basin water resources".[51] In the Niger basin, the Niger River Basin Authority, based in Niamey, provides riparian countries with scientific and technical information aimed to inform decision-making, in particular as regards the selection of locations for new dams.[52]

DESERTIFICATION, DROUGHT AND CLIMATE CHANGE

Aridity zones

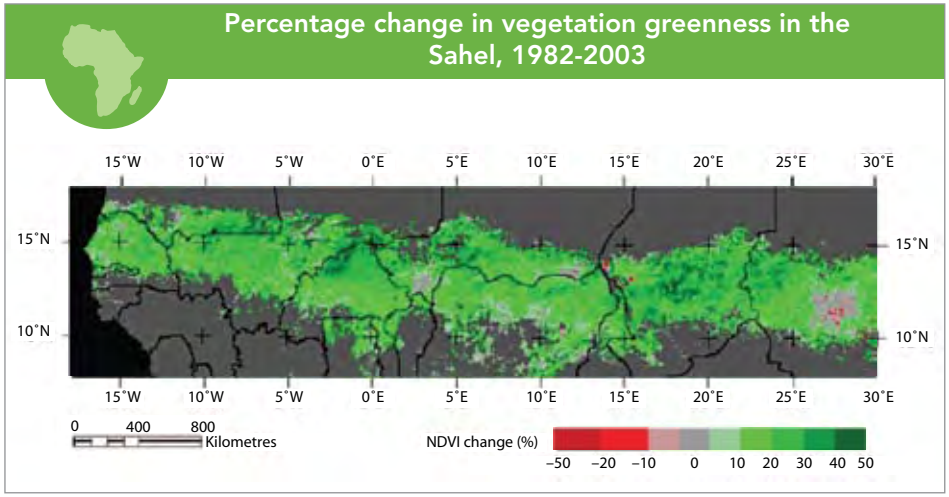


Source: UNEP-GRID, 2007.

> "Drought is the silent killer—the natural catastrophe that is only too easily forgotten."
>
> Hama Arba Diallo
> Former Executive Secretary of the
> United Nations Convention to Combat Desertification, 2005

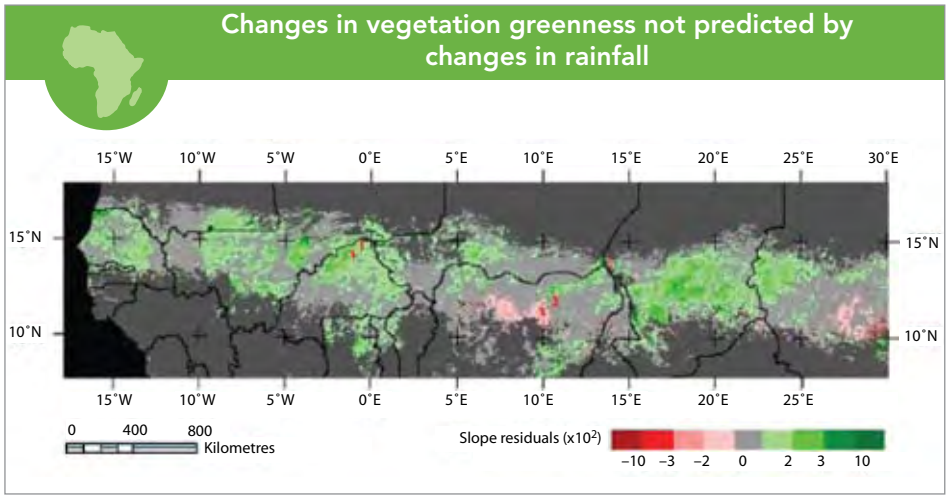
More than 30 per cent of the world's drylands are found in susceptible dryland regions in North Africa, the Sahel and the southern part of Africa.[53] They cover almost 2 billion hectares in 25 countries, representing 65 per cent of the continental land mass. Over 400 million people live in the drylands of Africa and the majority of them are the rural poor. Moreover, the area registers an annual population growth rate of 3 per cent.[54]

Dryland areas in Africa are under threat from deforestation, soil erosion, nutrient mining, recurrent drought and climate change, potentially resulting in land degradation and desertification, and aggravated poverty. Sustainable agricultural innovations are key to limiting adverse impacts on the environment and on the livelihoods of rural populations.



Source: Herrmann, Anyamba and Tucker (2005).

Note: Overall trends in vegetation greenness throughout the period 1982-2003 based on monthly Advanced Very High Resolution Radiometer, Normalized Difference Vegetation Index (AVHRR NDVI) time series. Percentages express changes in average NDVI between 1982 and 2003.



Source: Herrmann, Anyamba and Tucker (2005).

Note: Overall trends in the residual NDVI throughout the period 1982-2003 based on regression of vegetation greenness (AVHRR NDVI) on 3-monthly cumulative rainfall. Slopes of residual NDVI trend lines between 1982 and 2003 are expressed in units of NDVI x 104.

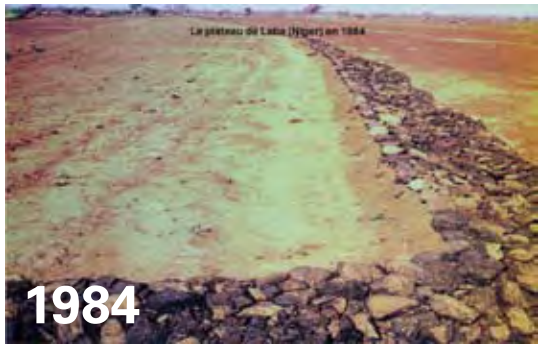
The Sahel has been greening in recent years.

Greening of the Sahel as observed from satellite images is now well established, confirming that trends in rainfall are the main but not the only driver of change in vegetation cover. For the period 1982-2003, the overall trend in monthly maximum Normalized Difference Vegetation Index (NDVI) is positive over a large portion of the Sahel region, reaching up to 50 per cent increase in parts of Mali, Mauritania and Chad, and confirming previous findings at a regional scale.[55]

Local conditions seem to have influenced the extent of vegetation recovery.

Some areas have greened more than what would be expected from rainfall recovery alone. In some regions (e.g., Niger Delta of Mali; south-western Mauritania), increases in vegetation can be explained by an expansion of irrigation. For other regions, such as the Central Plateau of Burkina Faso, recovery of vegetation greenness beyond what would be expected from the recovery of rainfall is thought to be the result of increased investment and improvements in soil and water conservation techniques. Some areas have registered less greening than expected from rainfall patterns.

The Niger has witnessed reforestation and population increase at the same time

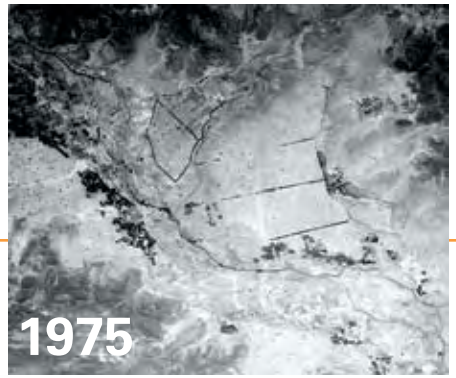


Source: CILSS and others, 2005.

The Lama plateau in the Niger in 1984 (above) and 2004 (below).

Source: CILSS and others, 2005.

Better conservation and improved rainfall have led to at least 6 million newly tree-covered acres in the Niger, achieved largely without relying on large-scale planting of trees or other expensive methods often advocated for halting desertification. Moreover, these gains have come at a time when the population of the Niger has grown rapidly, confounding the conventional wisdom that population growth leads to the loss of trees and accelerates land degradation.

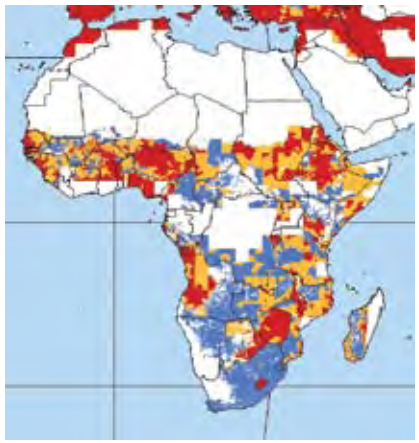


Source: CILSS and others, 2005.

Kware village neighbourhood in 1975 (left) before interventions and in 2003 (SPOT image). Black dots are trees. Windbreaking lines consisting of trees are clearly visible in 2003 (below).

An evaluation project undertaken in three areas of the Niger in 2005 (Tahoua, Tillabéri and Maradi) points to encouraging results in the locations of projects initiated to fight desertification with support from donors, compared to areas where no such project was implemented. Degraded lands have been reclaimed and restored to crop production by local populations. Water tables have risen significantly, which has made possible the development of vegetable gardens that have become significant producers at the national level. In the three regions studied, yields have increased both for millet and sorghum. Side benefits of land regeneration have included reduced vulnerability of women and reduced emigration rates.[56]

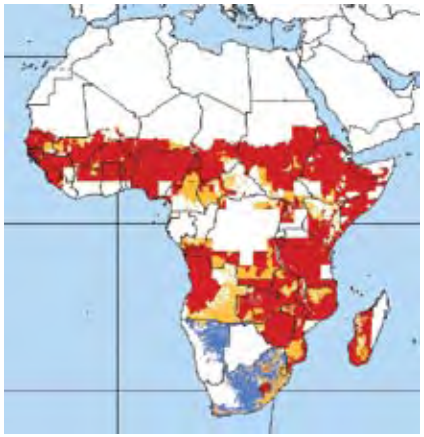
Mortality risks and economic loss from drought



Drought total economic loss

Risk deciles

- 1st to 4th
- 5th to 7th
- 8th to 10th



Drought mortality

Risk deciles

- 1st to 4th
- 5th to 7th
- 8th to 10th

Source: World Bank, 2005, Global Disaster Hotspots.

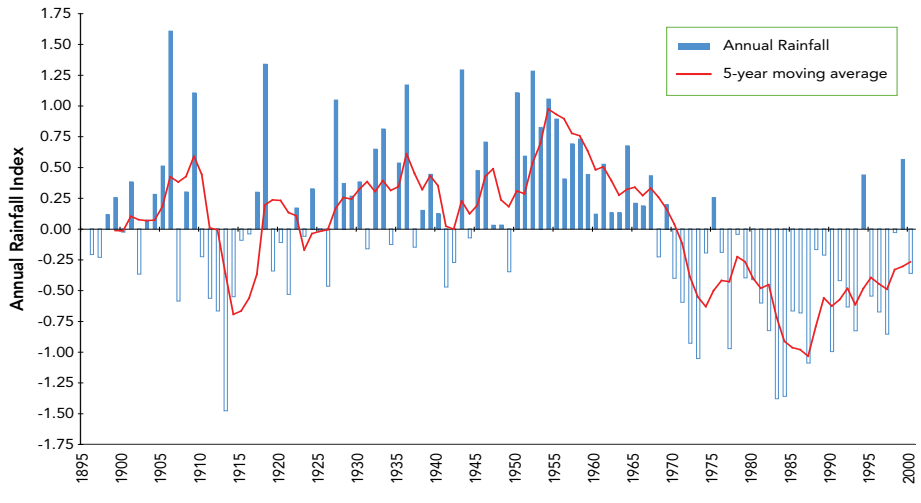
Note: Deciles are based on all regions, not only Africa.

Africa is most vulnerable to extreme weather events.

According to a global study undertaken by Columbia University and the World Bank, Africa is not stricken by more natural disasters than other continents. However, impacts of such disasters tend to be particularly high in Africa, both in terms of number of people affected and in terms of mortality from droughts and floods. A global study of losses from drought found that drought mortality hot spots are concentrated exclusively in sub-Saharan Africa.[57]

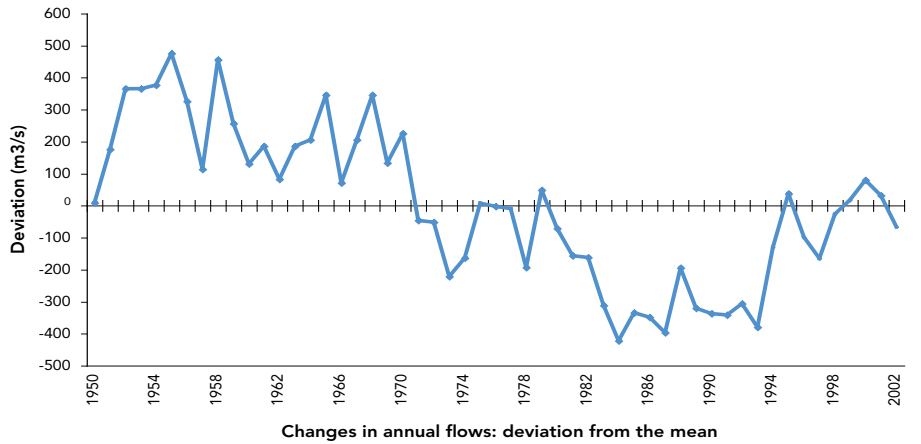
While economic loss hot spots for drought tend to include more developed regions, for example in southern Europe and the Middle East, Mexico, north-east Brazil and north-east China, a sizeable portion of African territory is also located in the top deciles for economic losses due to drought.[58]

Composite time series of rainfall deviations from long-term means for several Sahel stations



Source: Agrhymet, 2005.

Changes in the annual flow of the Niger River in Niamey, Niger

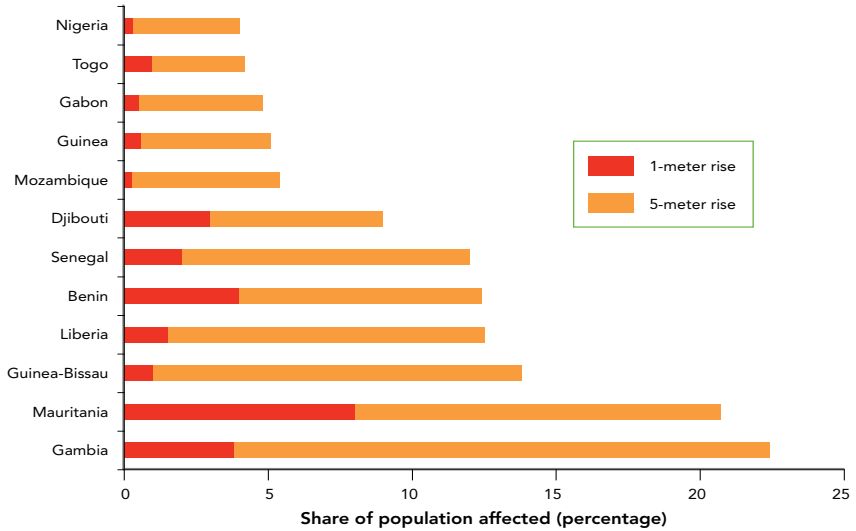


Source: CILSS, 2005.

Variations in climatic conditions have been observed for a long time in Africa.

Changes in rainfall patterns observed in the Sahel in the 1970s and 1980s have dramatically affected livelihoods in that region, which already had to cope with highly irregular and unpredictable rainfall patterns. Decreases in rainfall have had profound repercussions on the flows of the main rivers that provide an essential source of livelihood for the population of arid areas. Declines in river flows and runoff in those regions have typically been more pronounced than those in rainfall.[59] Decreased river flows have contributed to the shrinking of Lake Chad, one of the largest lakes of Africa. Recent years have registered somewhat more favorable rain conditions. However, extreme weather events have also become more common.[60]

Countries with highest projected share of population affected by sea-level rise



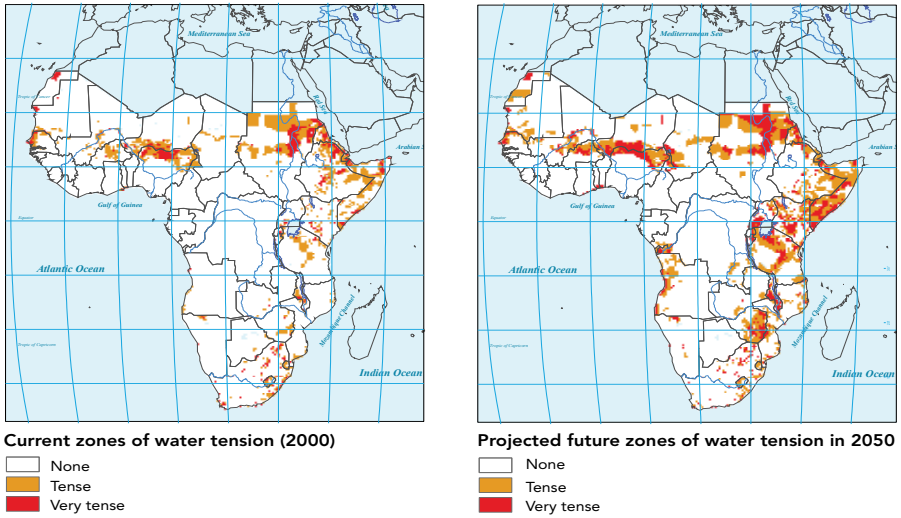
Source: World Bank, 2007.

Impacts from sea-level rise will be high for some African countries.

Climate change is expected to translate into sea-level rise during the next century. The extent of the rise is still uncertain. According to World Bank estimates, less than a quarter of 1 per cent of sub-Saharan Africa's GDP would be impacted by a 1-metre sea-level rise. Only a very small percentage of the region's area and agricultural land would be affected.[61]

However, some countries would be much more severely affected. The countries with greatest land area impact would be the Gambia and, to a lesser extent, Guinea-Bissau. Banjul, the capital city of the Gambia, is particularly vulnerable to sea-level rise and the entire city could be lost with a 1-metre rise in sea level.[62] A major ecological and economic consequence of sea-level rise would be the destruction of wetlands and mangroves, which currently provide livelihoods to coastal populations. Approximately 15 per cent of Benin's wetlands would be impacted by a 1-metre sea-level rise.[63]

Current and projected zones of water tension

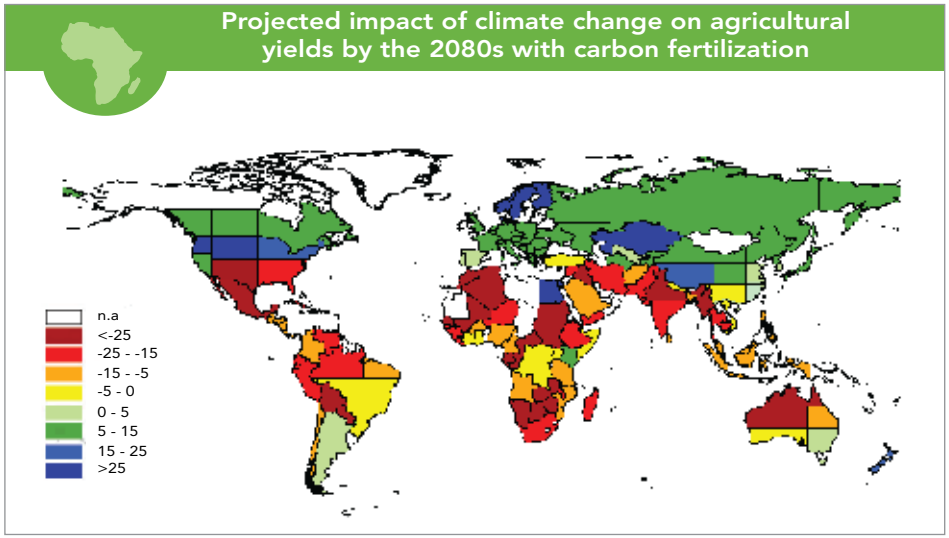


Source: Le Blanc and Perez, 2008.

Note: Tension in these maps is defined based on population densities conditional on average annual rainfall.

Climate change, by modifying rainfall patterns, could exacerbate water tensions on the continent.

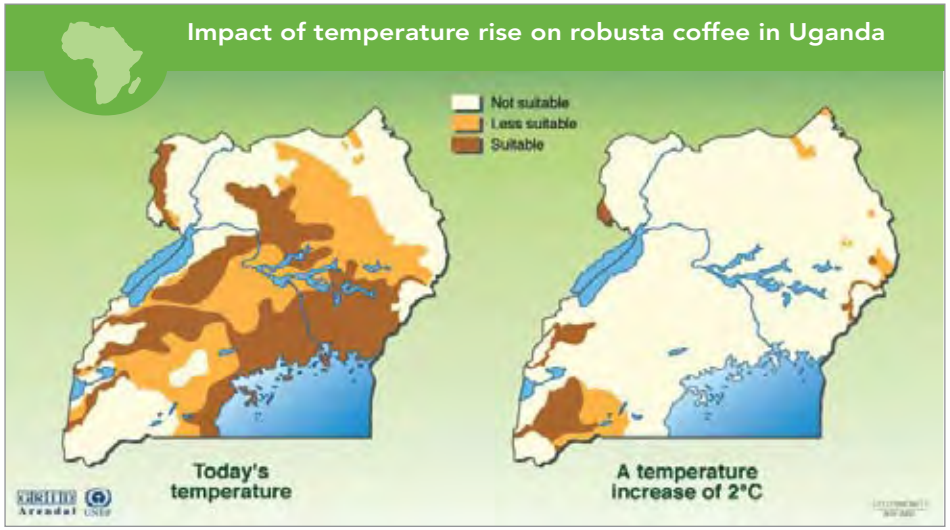
On most of the continent, population growth is going to impose additional pressure on water resources compared to the present situation, in particular in the Sahel but also in Eastern Africa. However, changes in rainfall will modulate substantially the demographic impacts, and may have very different implications in different subregions and at the country level. Many climate models project a wetter Sahel in the coming decades, as well as drier conditions for Eastern Africa. If these trends materialize, pressure on the water resources in the Sahel could be eased somewhat, although not to a sufficient extent to counterbalance the impact of population growth. Eastern Africa is likely to see its situation worsen, because demographic and climate impacts are predicted to work in the same direction towards increasing water stress.[64]



Source: Cline, 2006.

Africa is the region where the impacts of climate change on agriculture are predicted to be the most severe.

Increasing temperatures and changed rainfall patterns will affect African agriculture dramatically, by changing the geographical distribution of areas suited to the different crops. Keeping current crop mixes would result in decreased yields due to suboptimal climatic conditions compared to the current situation. As a result, countries will have to adjust the mix of crops they grow. Recent research focusing on the biophysical effects of climate change (precipitation and temperature) suggests that Africa would be the continent most affected by climate change from the point of view of agricultural productivity, with almost all countries undergoing losses of productivity, even after crop adjustments and the positive effects of carbon fertilization are taken into account.[65]



Source: UNEP-GRID, 2002.

At the country level, important adjustments in crop mix may be needed due to climate change.

For some countries that are currently relying on a few crops, increases in temperature such as predicted by the main climate models will probably imply radical changes in the agricultural production system, because the crops in question will not be adapted to the agroclimatic conditions of the country any more. Whereas most parts of Uganda are currently suited for coffee cultivation, one study estimates that a 2-degree Celsius temperature increase would render most of the country's area unsuitable for coffee.

SOURCES FOR MAPS AND GRAPHS

Introduction: general trends

- World Bank, World Development Indicators 2007.
- DFID, Conflict Trends in Africa, 1946-2004—A Macro-Comparative Perspective, http://www.dfid.gov.uk/pubs/files/africa-conflictpp-stats-report.pdf
- World Trade Organization Statistics Database, 2007.
- United Nations, MDG website, http://mdgs.un.org/unsd/mdg/Data.aspx
- World Bank, World Development Indicators 2007.
- United Nations, 2007, Africa and the Millennium Development Goals, 2007 update, http://www.un.org/millenniumgoals/docs/MDGafrica07.pdf

Demographic trends

- United Nations, Population Division, World Population Prospects: The 2006 Revision, http://esa.un.org/unpp/
- World Bank, World Development Indicators 2007.
- United Nations, Population Division, http://esa.un.org/unpp/p2k0data.asp
- United Nations, Population Division, http://www.un.org/esa/population/publications/WUP2005/2005WUP_DataTables3.pdf

Education

- United Nations MDG website, 2007, http://mdgs.un.org/unsd/mdg/Data.aspx
- World Bank, World Development Indicators 2007.
- UNCTAD, 2007, The Least Developed Countries Report 2007: Knowledge, Technological Learning and Innovation for Development, United Nations, New York and Geneva.

Health

- United Nations MDG website, 2007, http://mdgs.un.org/unsd/mdg/Data.aspx
- FAO, State of Food Insecurity in the World 2006, p. 10. ftp://ftp.fao.org/docrep/fao/009/a0750e/a0750e00.pdf
- International Finance Corporation and World Resource Institute (2007), The Next 4 Billion: Market Size and Business Strategy at the Base of the Pyramid, World Resources Institute, Washington, D.C.
- WHO, World Health Report 2006, annex 4. http://www.who.int/whr/2006/annex/en/index.html
- International Finance Corporation, 2007, The Business of Health in Africa: Partnering with the Private Sector to Improve People's Lives, Washington, D.C.
- UNICEF, 2006.
- United Nations, 2007, Africa and the Millennium Development Goals, 2007 update, http://www.un.org/millenniumgoals/docs/MDGafrica07.pdf
- UNAIDS/WHO, 2007, 07 AIDS epidemic update, December, http://data.unaids.org/pub/EPISlides/2007/2007_epiupdate_en.pdf
- United Nations, Population Division, World Population Prospects: The 2006 Revision, http://esa.un.org/unpp/
- UNAIDS, http://data.unaids.org/pub/GlobalReport/2006/Annex2_Data_en.xls for AIDS orphans, http://data.unaids.org/pub/GlobalReport/2006/2006_GR_ANN3_en.pdf for coverage by viral therapy.
- UNAIDS/USAID/UNICEF, 2004, Children on the brink 2004, http://www.unicef.org/publications/files/cob_layout6-013.pdf

Infrastructure and services

- UNESCO-UNICEF, Joint Monitoring Programme, 2006, http://www.wssinfo.org/en/watquery.html
- International Energy Agency (IEA), 2002, World Energy Outlook: Energy and Poverty, http://www.worldenergyoutlook.org/weo/pubs/weo2002/EnergyPoverty.pdf
- World Bank, Africa Development Indicators 2006.
- IFC and World Resource Institute (2007), The Next 4 Billion: Market Size and Business Strategy at the Base of the Pyramid, World Resources Institute, Washington, D.C.
- African Development Bank, 2007, Selected Statistics on African countries, volume XXVI.
- International Telecommunication Union (ITU), 2007, World Telecommunication Indicators 2006. Geneva: ITU. Available online at http://www.itu.int/ITU-D/ict/publications/world/world.html
- International Telecommunication Union (ITU) 2007, Telecommunication/ICT markets and trends in Africa 2007, http://www.itu.int/ITU-D/ict/statistics/material/af_report07.pdf

Structure of the economy

- World Bank, World Development Indicators 2007
- IMF, 2007, IMF Statistics, http://www.imfstatistics.org/imf
- World Trade Organization, WTO Statistics Database, 2008.
- Harry G. Broadman, 2007, Africa's Silk Road: China and India's New Economic Frontier, World Bank, Washington, D.C.
- United Nations, 2007, Agro-based industries and growth: prospects for sub-Saharan Africa, Sustainable Development Innovation Brief, No. 3, July, http://www.un.org/esa/sustdev/publications/innovationbriefs/no3.pdf
- Economic Commission for Africa, African Union, 2007, Economic Report on Africa 2007: Accelerating Africa's Development through Diversification, Addis Ababa.
- African Development Bank, 2007, Selected Statistics on African countries, volume XXVI.
- Patrick Honohan and Thorsten Beck, 2007, Making Finance Work for Africa, World Bank, Washington, D.C, p. 60.
- World Bank, Financial Structure Database.

Agriculture

- World Bank, World Development Indicators 2007.
- IFPRI, 2007.
- FAO, 2007, FAOSTAT, http://faostat.fao.org

- Market access map reproduced with permission from the International Food Policy Research Institute www.ifpri.org. The report from which this figure comes can be found online at http://www.ifpri.org/pubs/abstract/rr150.asp#dl.
- World Bank, 2006, "Can Water Undermine Growth? Evidence from Ethiopia", Agricultural and Rural Development Notes, issue 18, September.
- Policy map, agricultural exports: UN-DESA, 2007, Agro-based industries and growth: prospects for sub-Saharan Africa, Sustainable Development Innovation Brief, No. 3, July, http://www.un.org/esa/sustdev/publications/innovationbriefs/no3.pdf

Development finance

- World Bank, World Development Indicators 2007.
- World Bank, 2006, Global Development Finance 2006, Washington, D.C.
- OECD, 2008, www.oecd.org/dac/stats
- UNCTAD, 2007, The Least Developed Countries Report 2007: Knowledge, Technological Learning and Innovation for Development, United Nations, New York and Geneva.

Natural resources

- IUCN, Red Book 2004.
- Millennium Ecosystem Assessment (2005), Ecosystems and human well-being, Biodiversity synthesis, http://www.millenniumassessment.org/documents/document.356.aspx.pdf
- UNEP-WCMC, GeoData portal, http://geodata.grid.unep.ch/
- FAOSTAT, 2007, http://faostat.fao.org
- Millennium Ecosystem Assessment, 2005, Ecosystems and human well-being, synthesis, p. 3, http://www.millenniumassessment.org/documents/document.356.aspx.pdf
- Photos of logging roads courtesy of Nadine T. Laporte, 2007.
- G. Harper, Conservation International. Source: Our Changing Planet: The U.S. Climate Change Science Program for Fiscal Year 2007, http://www.usgcrp.gov/usgcrp/Library/ocp2007/ocp2007-hi-land.htm
- UNEP-GRID.
- NASA, Visible Earth, http://visibleearth.nasa.gov/

Desertification, drought, and climate change

- UNEP-GRID, http://maps.grida.no/go/graphic/aridity_zones
- Stefanie M. Herrmann, Assaf Anyamba and Compton J. Tucker, 2005, "Recent trends in vegetation dynamics in the African Sahel and their relationship to climate", Global Environmental Change, Part A, vol. 15, No. 4, December, pp. 394-404.
- CILSS, USAID, GTZ and SDC, 2005, "Étude du Sahel : rapport étude pilote Niger", prepared by Yamba Boubacar, Mahamane Larwanou, Abdou Hassane, and Chris Reij in conjunction with International Resources Group (IRG), April 2005, available on www.cilss.bf.
- CIESIN, Center for Hazards and Risk Research at Columbia University and World Bank, http://www.ldeo.columbia.edu/chrr/research/hotspots/coredata.html; http://www.ldeo.columbia.edu/chrr/pdf/hotspots/maps/drought_economic_loss.pdf http://www.ldeo.columbia.edu/chrr/pdf/hotspots/maps/drought_mortality.pdf
- Agrhymet, 2005.
- Observatoire du Sahara et du Sahel, 2007.
- S. Dasgupta, B. Laplante, C. Meisner and D. Wheeler, 2007, "The impact of sea level rise on developing countries: a comparative analysis", World Bank Policy Research Working Paper 4136, February 2007.
- D. Le Blanc and R. Perez (2008), "The relationship between rainfall and human density and its implications for future water stress in Sub-Saharan Africa", Ecological Economics, in press.
- W. R. Cline, 2007, "Global warming and agriculture: impact estimates by country", Center for Global Development, Peterson Institute for International Economics, Washington, D.C.
- UNEP-GRID, http://maps.grida.no/go/graphic/impact_of_temperature_rise_on_robusta_coffee_in_uganda

ENDNOTES

[1] Economic Commission for Africa, African Union, 2007, Economic Report on Africa 2007: Accelerating Africa's Development through Diversification, Addis Ababa.

[2] IMF, 2007, Perspectives économiques régionales : Afrique sub-Saharienne, avril 2007, Washington, D.C.

[3] United Nations, 2007, Africa and the Millennium Development Goals, 2007 update, http://www.un.org/millenniumgoals/docs/MDGafrica07.pdf

[4] United Nations, 2007, Africa and the Millennium Development Goals, 2007 update, http://www.un.org/millenniumgoals/docs/MDGafrica07.pdf

[5] United Nations, 2007, Africa and the Millennium Development Goals, 2007 update, http://www.un.org/millenniumgoals/docs/MDGafrica07.pdf

[6] UNCTAD, 2007, The Least Developed Countries Report 2007: Knowledge, Technological Learning and Innovation for Development, United Nations, New York and Geneva.

[7] FAO (2006), The State of Food Insecurity in the World 2006, ftp://ftp.fao.org/docrep/fao/009/a0750e/a0750e00.pdf

[8] IFC and World Resource Institute (2007), The Next 4 Billion: Market Size and Business Strategy at the Base of the Pyramid, World Resources Institute, Washington, D.C.

[9] International Finance Corporation (IFC), 2007, The Business of Health in Africa: Partnering with the Private Sector to Improve People's Lives, Washington, D.C.

[10] International Finance Corporation (IFC), 2007, The Business of Health in Africa: Partnering with the Private Sector to Improve People's Lives, Washington, D.C.

[11] UNCTAD, 2007, The Least Developed Countries Report 2007: Knowledge, Technological Learning and Innovation for Development, United Nations, New York and Geneva.

[12] International Finance Corporation (IFC), 2007 The Business of Health in Africa: Partnering with the Private Sector to Improve People's Lives, Washington, D.C.

[13] P. Ndiaye, W. Soors and B. Criel, 2007, "A view from beneath: community health insurance in Africa", Tropical Medicine and International Health, 12 (2), pp. 157-161.

[14] WHO, United Nations communiqué, 29 November 2007.

[15] UNAIDS/WHO, 2007, 07 AIDS Epidemic Update, December, http://data.unaids.org/pub/EPISlides/2007/2007_epiupdate_en.pdf.

[16] UNAIDS/WHO, 2006 Report on the global AIDS epidemic, May 2006.

[17] World Health Organization (WHO), 2007, World Health Statistics 2007, http://www.who.int/entity/whosis/whostat2007.pdf.

[18] Emily Oster, University of Chicago, http://www.ted.com/index.php/talks/view/id/143.

[19] UNAIDS/USAID/UNICEF, 2004, Children on the brink 2004, http://www.unicef.org/publications/files/cob_layout6-013.pdf.

[20] IFC and World Resource Institute (2007), The Next 4 Billion: Market Size and Business Strategy at the Base of the Pyramid, World Resources Institute, Washington, D.C.

[21] International Telecommunication Union (ITU) 2007, Telecommunication/ICT markets and trends in Africa 2007, http://www.itu.int/ITU-D/ict/statistics/material/af_report07.pdf.

[22] V. Grey, 2006, The un-wired continent: Africa's mobile success story, http://www.itu.int/ITU-D/ict/statistics/at_glance/Africa_EE2006_e.pdf, and International Telecommunication Union (ITU) 2007, Telecommunication/ICT markets and trends in Africa 2007, http://www.itu.int/ITU-D/ict/statistics/material/af_report07.pdf.

[23] Economic Commission for Africa, African Union, 2007, Economic Report on Africa 2007: Accelerating Africa's Development through Diversification, Addis Ababa.

[24] Harry G. Broadman, 2007, Africa's Silk Road: China and India's New Economic Frontier, World Bank, Washington, D.C.

[25] United Nations, 2007, Agro-based industries and growth: prospects for sub-Saharan Africa, Sustainable Development Innovation Brief, No. 3, July, http://www.un.org/esa/sustdev/publications/innovationbriefs/no3.pdf.

[26] World Bank, 2006, Ethiopia: Towards a Strategy For Pro-Poor Tourism Development, Africa region, private sector unit, note number 24, August.

[27] Economic Commission for Africa, African Union, 2007, Economic Report on Africa 2007: Accelerating Africa's Development through Diversification, Addis Ababa.

[28] Patrick Honohan and Thorsten Beck, 2007, Making Finance Work for Africa, World Bank, Washington, D.C.

[29] Patrick Honohan and Thorsten Beck, 2007, Making Finance Work for Africa, World Bank, Washington, D.C.

[30] Patrick Honohan and Thorsten Beck, 2007, Making Finance Work for Africa, World Bank, Washington, D.C.

[31] X. Diao, P. Hazell, D. Resnick and J. Turlow, 2007, The Role of Agriculture in Development: Implications for Sub-Saharan Africa, Research Report 153, Washington, D.C., International Food Policy Research Institute.

[32] R. J. Scholes, and R. Biggs, eds., 2004, Ecosystem Services in Southern Africa: A Regional Assessment, Council for Scientific and Industrial Research, Pretoria.

[33] IPCC, 2001, Climate Change 2001: Working Group II: Impacts, Adaptation and Vulnerability, chapter 10, "Africa".

[34] S. W. Omamo, X. Diao, S. Wood, J. Chamberlin, L. You, S. Benin, U. Wood-Sichra and A. Tatwangire, 2006. Strategic Priorities for Agricultural Development in Eastern and Central Africa, Research Report 150, Figure 3.4, Washington, D.C., International Food Policy Research Institute.

[35] World Bank, 2006, "Can Water Undermine Growth? Evidence from Ethiopia", Agricultural and Rural Development Notes, issue 18, September 2006.

[36] International Research Institute for Climate and Society (IRI), 2007, "Climate risk management in Africa: learning from practice", Climate and Society, No. 1, http://portal.iri.columbia.edu/portal/server.pt?open=18&objID=1309&parentname=CommunityPage&parentid=0&mode=2&in_hi_userid=2&cached=true

[37] J. Syroka and E. Bryla (2007), "developing index-based insurance for agriculture in developing countries", Innovation Briefs, No. 2, March, http://www.un.org/esa/sustdev/publications/innovationbriefs/no2.pdf.

[38] H. Ben Hammouda and P. Osakwe, 2006, "Financing development in Africa: trends, issues and challenges", ATPC work in progress, Economic Commission for Africa.

[39] World Bank, 2006, Global Development Finance 2006, Washington, D.C., http://www-wds.worldbank.org/external/default/main?pagePK=64193027&piPK=64187937&theSitePK=523679&menuPK=64187510&searchMenuPK=64187283&theSitePK=523679&entityID=000112742_20060605160927&searchMenuPK=64187283&theSitePK=523679

[40] Harry G. Broadman, 2007, Africa's Silk Road: China and India's New Economic Frontier, World Bank, Washington, D.C.

[41] OECD, 2007, Development Cooperation Report 2006.

[42] H. Ben Hammouda and P. Osakwe, 2006, "Financing development in Africa: trends, issues and challenges", ATPC work in progress, Economic Commission for Africa.

[43] UNCTAD, 2007, The Least Developed Countries Report 2007: Knowledge, Technological Learning and Innovation for Development, United Nations, New York and Geneva.

[44] Millennium Ecosystem Assessment, 2005, Ecosystems and human well-being, Biodiversity synthesis, http://www.millenniumassessment.org/documents/document.356.aspx.pdf.

[45] Convention on Biodiversity (CBD), 2007, Global Biodiversity Outlook 2, http://www.cbd.int/doc/gbo2/cbd-gbo2-en.pdf.

[46] FAO, FAOSTAT 2007.

[47] FAO, FAOSTAT, 2007.

[48] Nadine T. Laporte, Jared A. Stabach, Robert Grosch, Tiffany S. Lin and Scott J. Goetz, 2007, "Expansion of industrial logging in Central Africa", Science, 8 June 2007.

[49] Our Changing Planet: The U.S. Climate Change Science Program for Fiscal Year 2007, a report by the Climate Change Science Program and the Subcommittee on Global Change Research, a supplement to the President's fiscal year 2007 budget, http://www.usgcrp.gov/usgcrp/Library/ocp2007/ocp2007-hi-land.htm.

[50] UNEP, 2000, Global Environmental Outlook 2000.

[51] http://www.wilsoncenter.org/topics/pubs/NavigatingPeaceIssue4.pdf; http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/AFRICAEXT/0,,contentMDK:21405598%7EmenuPK:258657%7EpagePK:2865106%7EpiPK:2865128%7EtheSitePK:258644,00.html

[52] http://www.ambafrance-ne.org/article.php3?id_article=553

[53] Drylands are areas in which annual evapotranspiration exceeds rainfall and agricultural productivity is limited by poor availability of moisture. The dry sub-humid areas are also considered as part of dryland areas according to the widely applied United Nations classification (UNEP, 1992), which uses an aridity index (AI), defined as the ratio of annual precipitation to potential evapotranspiration.

[54] H. Roy-Macauley and A. Kalinganire, "Agroforestry innovations for greening dryland Africa: interest and obstacles", paper presented at the International Conference on Agricultural Innovation in Dryland Africa: What Are Key Drivers for Success?, held in Accra (Ghana), 22 to 24 January 2007, http://inco-aida.cirad.fr/news_conference

[55] Stefanie M. Herrmann, Assaf Anyamba and Compton J. Tucker, 2005, "Recent trends in vegetation dynamics in the African Sahel and their relationship to climate", Global Environmental Change, Part A, vol. 15, No. 4, December 2005, pp. 394-404.

[56] CILSS, USAID, GTZ and SDC, 2005, "Étude du Sahel : rapport étude pilote Niger", prepared by Yamba Boubacar, Mahamane Larwanou, Abdou Hassane and Chris Reij in conjunction with International Resources Group (IRG), April 2005, available on www.cilss.bf.

[57] IBRD/World Bank and Columbia University (2005), Natural disaster hotspots: A global risk analysis—synthesis report, http://sedac.ciesin.columbia.edu/hazards/hotspots/synthesisreport.pdf.

[58] ISDR, 2007, Disaster Risk Reduction: 2007 Global Review Consultation Edition, prepared for the Global Platform for Disaster Risk Reduction, first session, Geneva, Switzerland, 5-7 June 2007, ISDR/GP/2007/3.

[59] UNEP, 2007, Sudan Post-conflict Environmental Assessment, June.

[60] Al-Hamndou Dorsouma, "Dégradation des terres et adaptation aux changements climatiques: quelles implications pour le développement agricole en zone circum-saharienne ?", presentation to the African Development Bank (AfDB) Annual Donor Meeting, Tunis, 30-31 October 2007, http://www.afdb.org/pls/portal/url/ITEM/3DE02F036A352B9BE040C00A0C3D5B24

[61] S. Dasgupta, B. Laplante, C. Meisner and D. Wheeler, 2007, "The impact of sea level rise on developing countries: a comparative analysis", World Bank Policy Research Working Paper 4136, February 2007.

[62] Based on a map published online by UNEP, http://maps.grida.no/go/graphic/impact_of_sea_level_rise_in_banjul_gambia

[63] S. Dasgupta, B. Laplante, C. Meisner and D. Wheeler, 2007, "The impact of sea level rise on developing countries: a comparative analysis", World Bank Policy Research Working Paper 4136, February 2007.

[64] D. Le Blanc and R. Perez (2008), "The relationship between rainfall and human density and its implications for future water stress in sub-Saharan Africa", Ecological Economics, forthcoming.

[65] W. R. Cline, 2007, Global Warming and Agriculture: Impact Estimates by Country, Center for Global Development, Peterson Institute for International Economics, Washington, D.C.

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