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Sub-Saharan Africa: Environmental Issues

Introduction

The 47 countries comprising sub-Saharan Africa* depend more on their natural resource base for economic and social needs than any other region in the world. Two-thirds of sub-Saharan Africa's people live in rural areas and rely on agriculture and other natural resources for income. However, the environmental resource base of the region is shrinking rapidly. Environmental problems of sub-Saharan Africa include air and water pollution, deforestation, loss of soil and soil fertility, and a dramatic decline in biodiversity throughout the region. Although Africa's various environmental problems are increasingly severe, most countries are so crippled by poverty that few resources are available for managing the environment.

Sub-Saharan Africa has one of the world's fastest growing populations (approximately 2.2% a year), and is expected to be home to over a billion people by 2025. In recent years, population growth rates have declined from 2.4% in 1997 to an expected rate of less than 2% by 2006. More effective economic policies in many sub-Saharan African countries since the mid-1990s have led to improved economic development and performance. During 1995-98, real GDP growth averaged 4.25% a year, an increase from less than 1.5% a year during 1990-94. Real GDP growth has stagnated more recently, however, at about 3.0% for the past two years. Inadequate levels of investment of both physical and human capital persist, as exceptionally high levels of risk and uncertainty remain at the core of Africa's lack of competitiveness. Establishing a positive investment climate in Africa is increasingly important as the HIV/AIDS epidemic is poised to undermine economic growth for the next 15 years.

2002 World Summit on Sustainable Development

In August 2002, South Africa hosted the World Summit on Sustainable Development (WSSD), a follow-up conference to the Earth Summit held in Rio de Janeiro in 1992. The agenda of the conference was organized around five issues defined in the WEHAB Initiative: Water and sanitation; Energy; Health; Agriculture; and Biodiversity. WSSD was the first major environmental summit that addressed energy directly rather than just through other issues. Discussions on energy stressed the benefits of small-scale energy investments; the importance of targets and timetables for energy access and renewables; and energy policies that include capacity building, energy efficiency, and mechanisms to improve markets.

There were two major benefits for sub-Saharan Africa simply because WSSD was held in South Africa. Many of the environmental and developmental issues faced by Africans received more attention than in past international environmental summits. As a result, many developed countries, including the United States, promised funds to Africa to address development and environmental challenges. The United States pledged \$4.5 billion over the next three years to combat HIV/AIDS and improve access to safe water. Additional projects include a United States project in the Congo River Basin to promote forest conservation, and a project sponsored by the European Union to bring water and sanitation services in countries throughout sub-Saharan Africa.

The second major effect of WSSD being held on African soil has been an increase in environmental awareness. This began even before the conference as non-governmental organizations and citizens' groups throughout Africa started collaborating to bring their issues to the forefront of the summit. The increase in environmental awareness was not just seen among NGOs, but also within governments and among the general population. As people learn more about environmental degradation, they could begin to demand that their governments address the issues more forcefully. While it is possible that this increase in awareness could lead to strong, enforceable environmental legislation in African countries, most countries in Africa still face significant problems of poverty that will have to be addressed before significant environmental action is feasible.

With the exception of Somalia and Liberia, every sub-Saharan African nation has signed and ratified the United Nations Framework Convention on Climate Change as a non-Annex I country, and is therefore not obligated to reduce its emissions of greenhouse gases.

*(South Africa has been excluded from this report as the structure of its economy and energy sector is considered to be on par with many developed countries).

Environmental Impact of Oil Exploration and Production

Oil pollution is an important and controversial subject of discussion in sub-Saharan Africa. In countries such as [Nigeria](#) and [Angola](#), where the principal source of revenue is oil, debate on the impacts of oil exploration and development on the environment and the health of the community occur frequently between government, local citizens, environmental groups and oil companies. Many believe that the presence of oil refineries, wells and transportation activities in their countries is positive, giving them the opportunity to increase and diversify their trade relationships with other nations and to participate in the global economy.

Environmental problems associated with oil-related activities are numerous. For example, in shipping ports, where the transshipment of oil takes place, the chronic release of oil into the water through ship leakage, ship maintenance or mishandling is a continuing dilemma. This problem is often ignored, despite the fact that its cumulative effects may have significant effects on the surrounding ecosystem. Natural habitats, such as seabeds, wetlands and mudlands, which are increasingly recognized as fundamental elements of a country's natural environment and economic resource base, are often located near or in maritime port locations.

As world oil demand increases, oil-producing countries in sub-Saharan Africa are increasing their production and export capacities, leading to an increasing volume of oil being shipped through pipelines and via tankers. As shipping lanes become more congested, the chances of spills and accidents increase, putting the environment at greater risk.

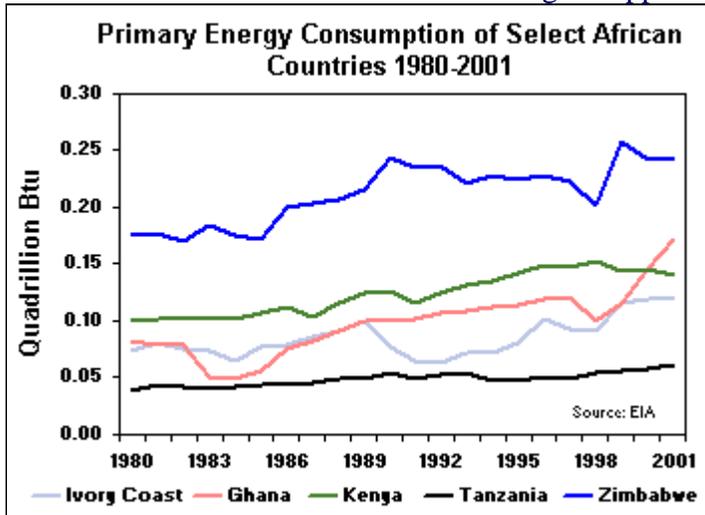
A recent example of growing global awareness towards the environmental impacts associated with oil exploration and development was the controversy surrounding the World Bank's approval of the [Chad-Cameroon](#) Pipeline Project in June 2000. The project, led by ExxonMobil Corp., is one of the largest construction ventures in sub-Saharan Africa ever (\$3.7 billion), and is expected to bring Chad \$80-\$100 million a year (about half of Chad's budget) and Cameroon \$20 million a year. Plans for the Chad-Cameroon Pipeline Project include development of Chad's Doba oil fields, construction of a 673-mile pipeline from the Doba oil fields to Cameroon's Atlantic coast at Kribi, installation of an offshore floating storage and offloading vessel, and a submarine pipeline from the Atlantic coast to the vessel. Construction on the pipeline began in 2000 and the first barrels of oil were pumped through in July 2003.

Despite its recent success, the project has been the target of vehement protests from environmental

and human rights groups, which argue that the project would harm wildlife (black rhinos, chimpanzees, gorillas and elephants) in the rainforests which the pipeline would pass through, dislocate inhabitants along the pipeline route, and further increase civil strife through profiteering by local officials.

Energy Use and Carbon Emissions

Energy consumption in sub-Saharan Africa varies dramatically with noncommercial fuels, such as wood and animal waste, dominating fuel consumption. The use of wood for fuel is predominant in both rural and urban locations -- accounting for approximately 70% of total energy use and 90% of

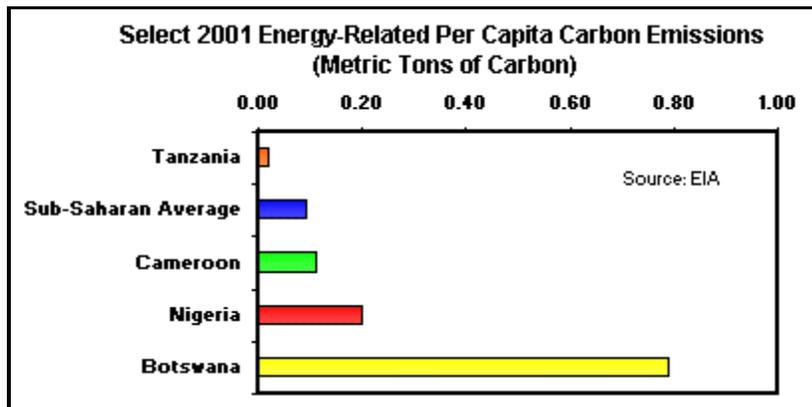


household energy use in sub-Saharan Africa. Africa is the world's largest consumer of biomass energy (firewood, agricultural residues, animal wastes, and charcoal), calculated as a percentage of overall energy consumption. In 2001, total commercial energy consumption in sub-Saharan Africa measured 2.90 quadrillion British thermal units (Btu).

Nigeria consistently leads sub-Saharan Africa in commercial energy consumption. In 2001, Nigeria consumed 0.92 quadrillion Btu (quads), 32% of all energy consumed in the region. Of the remaining countries,

Zimbabwe registered the next highest level with 0.24 quads of energy consumed. Ghana followed close behind with consumption of 0.17 quads. These numbers are generally higher than in most of sub-Saharan Africa, which averaged a low 0.06 quads in 2001. Although domestic demand for energy consumption in sub-Saharan Africa is growing rapidly, consumption levels remain well below world averages.

Per capita energy-related carbon emissions in sub-Saharan Africa countries vary greatly, in part because certain countries tend to consume more carbon intensive fuels than others. For example, in 2001 Botswana emitted 0.79 metric tons of energy-related carbon per person, more than five times the sub-Saharan per capita rate. Botswana has relatively abundant sources of cheap coal and therefore burns more coal for energy use than most other sub-Saharan nations.



The carbon content of coal is much higher than other fossil fuels such as oil and natural gas, and is therefore responsible for the higher rates of carbon emissions among coal-burning countries. Although the average level of per capita energy-related carbon emissions in sub-Saharan Africa (0.09 metric tons) is expected to increase as a result of economic and urban expansion in coming years, per capita energy-related carbon emission levels are expected to continue to remain well below the world average of 4 metric tons per person.

The flaring of natural gas in Nigeria, Angola, Cameroon, and Gabon has proven to be a



significant source of carbon emissions in sub-Saharan Africa. In the process of oil production, natural gas is released. Because gas infrastructure in sub-Saharan Africa is extremely limited, this "associated" gas is often burned off, or "flared," rather than captured for use. Not only does this waste a potentially valuable energy source (the World Bank estimates that every day Africa flares gas equivalent to twelve times the energy that the continent uses), but it releases carbon dioxide directly into the atmosphere. Nigeria is working on developing a gas-to-liquids industry and expanding their liquefied natural gas trade to reduce flaring. The government has set a deadline of 2008 for the termination of all gas flaring, with heavy fines for companies that do not comply.

Deforestation and Desertification

Central Africa is home to one of the world's largest rain forests, and serves as one of the world's most important carbon sinks. Carbon sinks capture carbon dioxide from the atmosphere, thus reducing global carbon dioxide levels. Deforestation is one of the most pressing environmental problems faced by almost all sub-Saharan African nations, with one of the primary causes of deforestation being wood utilization for fuel. Many sub-Saharan countries have had over three quarters of their forest cover depleted, and it is estimated that if current trends continue, many areas, especially that of the Sudano-Sahelian belt, will experience a severe shortage of fuelwood by 2025. Deforestation also has negative implications for the local environment (increased erosion and loss of biodiversity). The highest rates of deforestation occur in areas with large growing populations such as the East African Highlands and the Sahel.

At the World Summit for Sustainable Development, the United States joined forces with the governments of Cameroon, the Central African Republic, the Democratic Republic of the Congo, Equatorial Guinea, Gabon and the Republic of Congo along with multilateral donors to promote economic development in the Congo River basin through natural resource conservation programs. The program creates a network of parks and protected areas, well-managed forestry concessions, and assistance to communities who depend upon the conservation of the forest and wildlife resources in the Congo River Basin. The United States plans to invest \$53 million through 2005 on this project and additional government, intergovernmental, and non-governmental partners are also expected to contribute funds.

The harvesting of wood for use as fuel also has contributed to the problem of desertification. Desertification is the term used to describe the loss of soil fertility and structure to the extent that its ability to support plant life is severely compromised. In sub-Saharan Africa, where desertification has its greatest impact, forest areas are often cleared in order to harvest fuelwood and for agricultural use. Traditional farming practices, which tend to be inefficient and land-intensive, significantly degrade scarce arable land -- the single most important natural resource in sub-Saharan Africa. Desertification can lead to downstream flooding, reduced water quality and sedimentation in rivers and lakes. It also can lead to dust storms, air pollution and health problems such as respiratory illnesses and allergies. All 47 countries which comprise sub-Saharan Africa have signed and ratified the Convention to Combat Desertification, which entered into force in 1997.

Hydropower and other Renewable energy

Hydropower currently is experiencing a renaissance in many sub-Saharan countries especially given rising oil prices. Hydroelectric power is the only significant grid-connected renewable energy source in sub-Saharan Africa, and in several of the region's countries, hydroelectricity's share of total installed electric capacity is quite high. In Ivory Coast, the



Democratic Republic of Congo, Ethiopia, Mozambique, and Zambia, the vast majority of on-grid electricity generation comes from hydropower. Many new projects are planned or are under construction in main hydro areas such as the Congo River, the Nile River, and the Zambezi River.

However, environmental concerns associated with hydropower have been a factor in stalling construction in several projects. In Uganda, for example, the 22-meter-high Bujagali dam, which is to be located on the Nile river near the Bujagali Falls, has come under massive criticism from several environmental groups, who claim that the dam would displace several hundred local poor people, permanently destroy certain fisheries, eliminate the \$4 million per year the area receives from tourism (6,000 people raft the nearby Falls each year) and increase the possibility of serious water-borne diseases such as malaria. Large hydropower projects also can have negative implications for biodiversity and can permanently alter river ecosystems.

Many argue that because large portions of rural populations often are not hooked up to the energy grid (95% of the population in Uganda, for example), large and expensive projects do not solve these countries' energy problems. Many believe that alternative energy sources such as wind, geothermal, and solar power are the key to solving the massive energy deficits in sub-Saharan Africa. Several countries in the region have made considerable advances in the use of photovoltaic (PV), or solar power. Zimbabwe plans to utilize solar power to electrify over 500 districts and rural service points. Each site would receive solar systems with generation capacity of either 100 kilowatts (kW) or 500 kW. These solar systems can also be used for small scale projects such as milling grain, pumping water, and operating cookstoves. Zambia also is developing a program of electrification by solar energy in order to accelerate its rural electrification program. In Kenya, a series of similar programs, has resulted in the installation of more than 20,000 small-scale PV systems since 1986. These PV systems now play a prominent role in decentralized, sustainable electrification.

Outlook on Sub-Saharan Africa's Environmental Future

Public awareness and concern for the environment is becoming an increasingly important factor among decision makers in sub-Saharan Africa as they seek to expand the development of their economies. Increased environmental awareness among Africans and a desire for ecotourism dollars could be important motivators for environmental action. A significant amount of international attention also has been focused on the environmental problems which sub-Saharan Africa now faces, and is directly responsible for a large number of policy and awareness initiatives. For example, there are well over a hundred non-governmental organizations (NGO's) active in the preservation of the region's environment.

However, the institutional, economic, and legal capacities of most governments in the region remain ill-equipped and underfunded in dealing with environmental problems. Significant challenges to the region include increasing the framework for environmental assessment in sub-Saharan African countries, especially those which require sectoral and regional approaches. Sectors such as agriculture and urban management require significant attention as they have a close relationship to the environment and natural resource base of sub-Saharan Africa.

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