Develop Africa's vast food potential with great projects

by Marcia Merry

The last decade of this century opened to see hunger spreading in Africa through mass "famine belts," on a continent practically made-to-order for agriculture. In 1991, the World Food Program estimated that 30 million people needed emergency food relief in Africa; in 1992, the figure was 40 million. This includes the 4 million in Somalia, and 19 million in the Horn of Africa overall.

Estimated requirements for the continent as a whole, excepting Somalia, are (in metric tons):

Cereals: 486,000 per month; 5,832,000 per year
Pulses: 93,270 per month; 1,119,240 per year
Milk powder: 30,690 per month; 368,280 per year
Fats and oils: 29,460 per month; 353,520 per year
Total: 639,420 per month; 7,673,040 per year

The food shortage does not stem from lack of agricultural potential, nor even from drought, floods, or other weather disasters. The continent boasts some of the most outstanding "natural food belts" on the globe—for example, the nation of Sudan. If advanced farming methods and a food reserve policy were put in place, not even such disasters as the "drought of the century," which hit southern and eastern Africa in 1992, could cause such devastation. The decline of food output is the result of deliberate blockage of agriculture infrastructure and technology development.

The prerequisite for expanding output of food is to expand energy inputs per unit area of production, and/or to bring new areas into food production. For example, if the inputs per unit area of sorghum in the 50 nations of sub-Saharan Africa were comparable to the United States, then instead of the current level of 14 million tons of sorghum produced annually in this region of about 17 million hectares, about 63 millions of tons of sorghum could be harvested—a 70% increase! (U.S. average yields are 3,400-4,000 kg/HA; African yields are 800-900 kg/HA.)

The low yields in Africa directly reflect the low inputs per hectare—fertilizer, pesticides, mechanization, irrigation. The average fertilizer input per hectare in Africa as of 1990 was about 11 kg/HA, in contrast with a U.S. average of 95 kg/HA. Over the last 20 years, the index of food output per capita has fallen sharply from 110 in 1970 (based on 1980 as 100) down to 90 today.

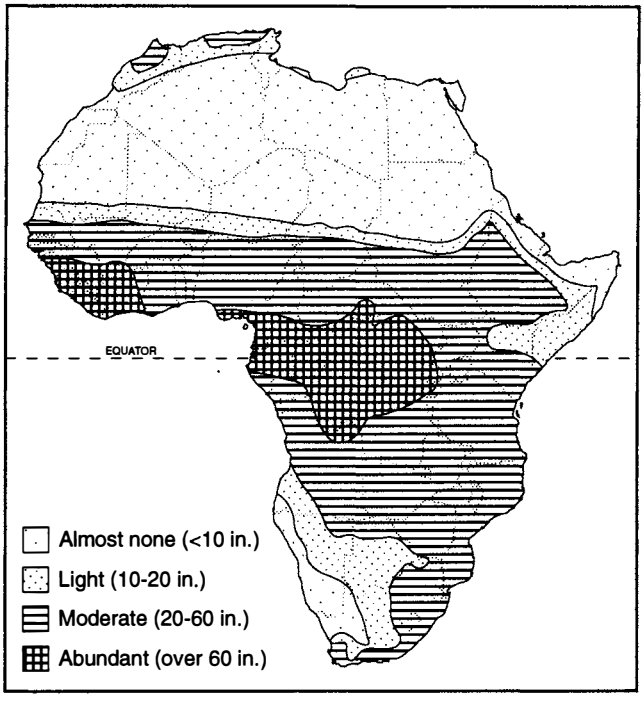
Cash crops cause ruin

Historically, agriculture infrastructure and inputs have been provided in Africa only for the crop areas and crops favored by the colonial powers: cash crops. At the same time, primitive methods were continued for cultivating food crops for the local population. Occasional food surpluses for export were realized only in North Africa (small grains and rice) and South Africa (corn).

One example of this is in the Gezira District of Sudan, where Africa's largest zone of irrigated agriculture is located, south of the Nile Valley in Egypt. The British colonial agriculture policy for Sudan was cotton production for export. When Sudan gained independence in 1956, there was not one single research station concerned with food. In 1925, the British started the Gezira irrigation scheme—devoted exclusively to cotton. The entire period of British control, from 1898 to 1956, was characterized by lack of improvements in crops and livestock, and low food output productivity.

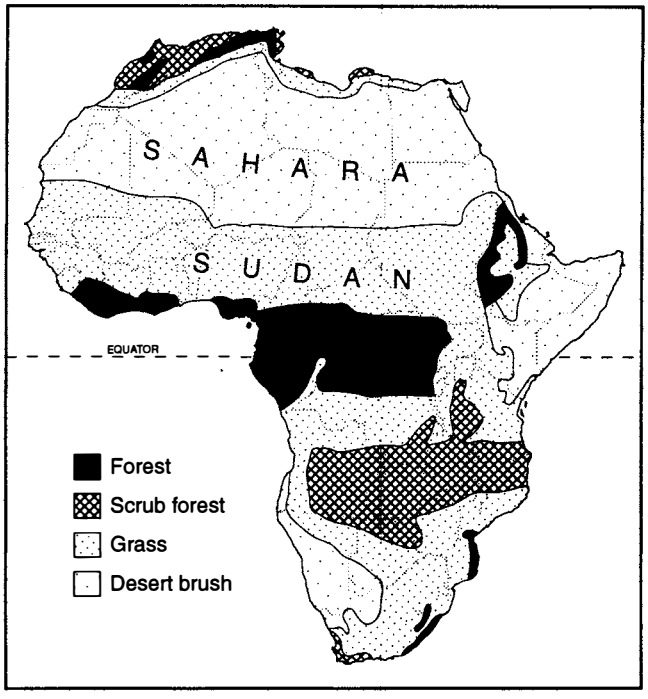
As of 1970, Africa's share (by value) of world exports averaged 80% for cocoa, 58% for peanuts, 54% for peanut oil, 51% for sisal, 37% for palm kernels, 27% for olive oil, and 27% for oranges and tangerines. Other significant cash crops included coffee, tea, cotton, wine grapes, sugar, and bananas.

FIGURE 1
Relative rainfall in Africa



Source: George F. Deasy, et al., *The World's Nations,* New York: J.B. Lippincott, 1958.

FIGURE 2
Types of dominant natural vegetation in Africa



Source: George F. Deasy, et al., *The World's Nations,* New York: J.B. Lippincott, 1958.

The physical geography

The maps show selected features of the physical geography of Africa, giving an idea of the vast agricultural potential. There is a notable absence of rugged mountain chains; most of the continent is an upland plateau, with an elevation of 660-3,000 feet in the north, and 3,000-6,000 feet in the south, edged all round by a coastal strip, and no piedmont.

There is extensive arable land. Out of a total land area of 2.13 billion hectares, an estimated 970.2 million is potentially useful for agriculture—172.3 million hectares of arable and permanent cropland, and 797.9 million hectares of permanent pasture. For comparison, South America's total land area is 1.753 billion hectares, with 116.2 million hectares of arable and permanent cropland, and 447.3 million hectares of permanent pasture.

Figure 1 shows the relative amounts of rainfall. The Sahara and the Somali-Ogaden Deserts stand out prominently in the north for "almost no" precipitation, along with the Namib Desert in the far southwest. However, under much of the Egyptian and Libyan deserts, and also in the western Sahara, are water deposits of significant quantities, some dating back to riverbeds of 5,000 years ago. Remote sensing from satellite overflights has located many such potential aquifers. Though much of the water is "fossil water," and not being replenished by rainfall, still the natural underground reservoirs could have a role in a transition period, probably 50 years or less.

A broad band of moderate rainfall of 20 to 60 inches sweeps across west Africa, to central Africa and southward. Depending on the terrain and seasonal distribution of the precipitation, these amounts are favorable to a wide variety of rainfed crops.

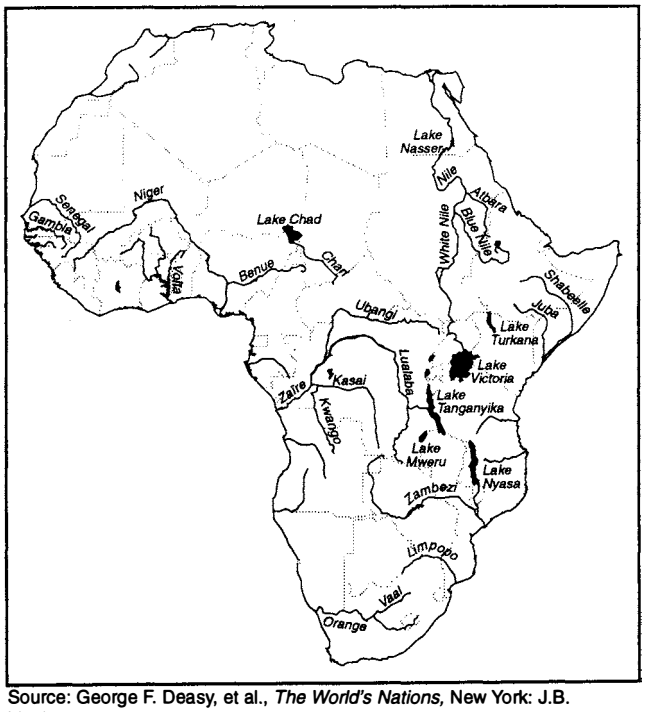
Finally, this moderate rainfall zone is banded by lighter rainfall along the north, northeast, and southwestern edges, and in the center, shades into the heavy rainfall belt in the heart of Africa—the huge Zaire (Congo) River basin.

Figure 2 shows the dominant natural vegetation types and gives a profile of agriculture in each regime.

Figure 3 shows the rivers and lakes of the continent. In volume, the Zaire River ranks second only to the Amazon River. Africa has 4,184 km^3 of total run-off, of which only about 3% is "withdrawn" for various uses, for an average per capita utilization rate of 244 cubic meters annually. In contrast, North America has a total run-off of 6,945 km^3, with about 10% withdrawn for utilization, giving an average per capita use rate of 1,692 cubic meters. Except for the lower Nile River, very little of the other African river systems have been developed to their potential for productive use.

Reflecting these geographic features, there are four main

FIGURE 3
Africa's rivers and lakes



Source: George F. Deasy, et al., *The World's Nations,* New York: J.B. Lippincott, 1958.

economic regions on the continent: the rain forest in the west, extending to Kenya in the east; the African shield, rich in rainfed farm potential as well as mineral wealth; the northern coastal regions, bordered by the Sahara on the south; and the Sudan-Sahelian region, extending into the Horn of Africa.

With state-of-the-art infrastructure, these regions are each world powerhouses. The following are just some of the agricultural aspects of the development potential.

- *The west-central, heavy rainfall area.* This area could boast one of the world's richest rice bowls, with water management and soil enrichment. In the past, the region was looted for cash crops like cocoa, bananas, palm oil, coconuts, and rubber.
- *The African shield.* Much of this grass and brushland area is known as the southern African corn belt, and with added inputs per hectare, the region is a natural for grain production.
- *Northern coastal regions.* The Mediterranean littoral is already famous for its output of citrus, dates, olives, winter vegetables, and similar crops, with wheat and small grains in the drier inland regions toward the desert. With additional water, the region can develop as one continuous garden.

In 1992, Libya "turned on the tap" of its national water project, the "Great Man-Made River," to bring water pumped from under the Sahara, via a giant underground pipeline, to the coast, to relieve the water crisis where saltwater is invading the coastal aquifers.

However, even cheaper and more plentiful water supplies can come from nuclear-powered seawater desalination plants along the Mediterranean. The cost per 1,000 gallons from such a plant, producing a million gallons a day, is less than $2. These nuclear-desalting plants will never run dry!

- *Sudan-Sahelian region.* This extensive area, characterized by grasslands, has the potential of being the foremost grain and grazing belt of the world. What is required is infrastructure for reliable water, transport, and mechanization. The area is the perfect locale for "man-made" rivers and lakes from a combination of geographic engineering and nuclear-powered desalination, as recommended in the "Oasis Plan" approach outlined by Lyndon LaRouche, for development of the Mideast.

The case of Sudan

This region's potential is epitomized by the nation of Sudan. The largest country in Africa, it has at least 200 million acres which could easily be cultivated—about half the current cultivated acreage base of the entire United States. Sudan's crop base could produce harvests sufficient to feed almost all of Africa. The country has another 218 million acres suitable for forestry, and 57 million acres for pasture.

However, at present, only 17 million acres are cultivated—8.5% of the potential acreage base. Of these, only 4.5 million acres are irrigated. Because annual rainfall is highly variable—up to 40% variation—the annual output of rainfed agriculture is highly variable.

Increasing the irrigated acreage can have miraculous harvest results. Sudanese nationalists in the 1970s moved to construct a straightened drainage channel (the Jonglei Canal, see map on page 73) for the upper White Nile, in order to augment the downstream Nile River flow for both Sudan and Egypt. Diminishing the swamps would open up new farmland in southern Sudan, eliminate dozens of pests, and allow easy travel and transport. However, after over 180 kilometers of the canal were built as of 1984, the project was killed by opposition from the World Bank, the International Monetary Fund (IMF), and a Saudi Arabian petrodollar group, the Arab Authority for Investment and Agricultural Development. Subsequently, needless harvest failures became frequent occurrences.

In 1991, Sudan suffered a severe food shortage because of short rainfall, combined with only cash crops in its Gezira irrigation zone, and the stoppage of construction on the Jonglei Canal. After the IMF "decertified" Sudan in October 1990, on the eve of the Persian Gulf war, with nothing to lose, the Khartoum government switched a portion of the Gezira to staple food crops, away from cotton. The purpose of this was food self-sufficiency, no matter what the rainfall.

In 1992, the sorghum harvest and other crops were so large that Sudan has pledged 100,000 tons of sorghum for

1993 food relief to Somalia—two months' worth of rations for 4 million people. Already 15,000 tons have been delivered by Sudan to the World Food Program.

Great projects for agriculture

The case of Sudan, and a short survey of the four main economic regions of the continent, all point to the necessity of great projects for agriculture development throughout the continent. Providing reliable water, high-energy inputs per hectare, and transportation, in the unique physical conditions of Africa, will yield spectacular results. Here are the specific projects:

River systems development. The Jonglei Canal should be resumed and completed as early as possible. The interbasin development of Lake Chad and the Zaire River system (Ubangi water diversion) must proceed (see map, page 73). The development of the Niger, Zambezi, and other river systems must proceed.

Oasis projects. Nuclear-powered seawater and brackish water desalination facilities must be located at strategic points on arid coastlines—the Mediterranean, Red Sea, Gulf of Aden, Indian Ocean—to create the basis for "agro-nuplexes," where large communities can live and work with the abundant power and water for agriculture, food and farm chemical processing, and industry. This is critical for Egypt, where over 97% of the currently available water—the Nile River flow—is utilized. Much of the desert between Cairo and and the Suez Canal can be readily transformed into arable cropland, with only the supply of adequate water and power.

Advanced technologies. Modern irrigation techniques—trickle, drip, hydroponics, and aeroponics—growing plants under environmentally controlled conditions, are essential for certain arid parts of Africa, such as Egypt and Somalia. Irrigation allows standard yield increases of at least four times; and hydroponics can allow up to 100 times more yield per surface area. Except in Sudan, in southern Africa, and a few other regions, many of the soil types on the continent are leached and poor. Advanced soil-less agriculture can circumvent this limitation. Successful tests have been done in South Africa for hydroponic fodder factories to maintain sheep and dairy herds.

Food irradiation. This method of preserving food, especially animal protein, could begin to bring diets up to needed nutrition levels, even before the continent is fully electrified. In hot or tropical areas, over half of many crops is lost to pests and decay; this can be stopped by irradiating the food for storage.

Fishing fleets and port facilities. Rich fish potential exists off the coasts of much of Africa—for example, the Gulf of Aden; but only the fishing off the coast of South Africa and west Africa has been utilized. Fleets of large fishing vessels, and port facilities for handling and preserving the catch, need to be developed as part of the great projects that can transform the resource continent.

Railroads needed for industrialization

The following material is excerpted from a chapter appearing in The Industrialization of Africa, *a book issued in 1980 by the Fusion Energy Foundation Wiesbaden, Germany, and New York, U.S.A. The book detailed a program for constructing a system of 164 new nuclear-powered African agricultural and industrial centers, or "nuplexes," which by the year 2000 could be serving as the drivers for bringing the entire African continent up to U.S. or western European economic standards.*

Unfortunately, the policy was not adopted, and in the 13 years since the book's publication, the condition of Africa's infrastructure has grown far worse than it was in 1980. Indeed, in April 1987, the Fusion Energy Foundation was forced to shut its doors in the United States because of a lawless bankruptcy action brought by political forces bitterly opposed to the policy of industrializing Africa and the rest of the Third World.

In terms of its structure, the present African railway system has hardly gone beyond that inherited from the colonial era, as a brief glance at **Figure 1** indicates.

1. No interconnected railway network exists. As a rule, the individual lines run from the coast inland, according to the economic conceptions of the former colonial masters, who looked upon their colonies as mere suppliers of raw materials. This situation is particularly grotesque in West and East Africa, while South Africa, and, to some extent, North Africa, have an actual network.

2. The present railway system is over-aged; about 90% of the lines were built during the colonial period.

3. Track widths differ, depending upon who the colonial masters were. **Table 1** summarizes the relative distribution proportions of these various systems. Such variations in track width (gauge) naturally make construction of a unified African railway network extremely difficult. Additionally, 85% of the entire network consists of narrow-width track, which may have been adequate, at the lowest possible investment-costs, for raw materials transportation, but which are completely inadequate for a developing industrial economy.

4. Another severe problem confronting today's African railways is the result of hidden "recolonialization" by institutions such as the International Monetary Fund (IMF) and World Bank. Lack of investments, due to restrictive financ-