


# Population growth and

How will sub-Saharan Africa cope with a growing population and decreasing food production per capita? The authors assess the situation and discuss ways in which the problems might be eased.

**Jacob Meerman and Susan Hill Cochrane**



The view persists that sub-Saharan Africa is underpopulated; that its economic growth will be accelerated if its population increases. This view is based on two arguments. First, that modernization (read: industrialization) is facilitated by large numbers of people because they make possible greater specialization and the application of productive modern techniques. Yet three quarters of the countries in the region have populations of less than ten million people. The second argument is that population density is low relative to arable land, which would be more productive if there were more people to work it.

Neither argument is really persuasive. Large numbers do not automatically lead to rapid economic development—the slow growth in India and Bangladesh testifies to this. The key element for economic growth

is production stimulated by the effective demand of large markets. For small countries, these have to be export markets. But rising populations in sub-Saharan Africa have led primarily to economic growth based largely upon traditional village agriculture, and this has not increased per capita output. Population growth of this genre could actually reduce total cash income per head because of diminishing returns as more labor is applied to a less productive agriculture. And rising populations in Africa have also made more difficult the training of enough skilled people, on which countries such as Korea and Taiwan based their rapid growth in production (and exports).

It is true that the density of population in the region is very low—on average less than one fifth of that in Asia. But in Asia,

## World Bank's Africa report

For a detailed study of the problems of growth in sub-Saharan Africa, see *Accelerated Development in Sub-Saharan Africa: An Agenda for Action* (World Bank, 1981). This report was requested by the African Governors of the World Bank and was discussed, in September 1981, at a meeting between African finance ministers and the President of the Bank, and by the Joint Development Committee of the Bank and the International Monetary Fund. The report was also discussed by the African Governors in March 1982 when they concluded that the "report . . . represents a valuable contribution to the implementation of the Lagos Plan of Action," adopted by the African Heads of State at the meeting of the Organization of African Unity in April 1980, and which outlines a framework for a more self-reliant and economically integrated Africa by the year 2000. Citing three areas where change is most needed: trade and exchange rate policies; resource management; and redressing the bias against agriculture, the report emphasizes the importance both of more assistance and of a decisive change in national policies.

The World Bank plans to give priority to sub-Saharan Africa in the allocation of low interest funds from the International Development Association, as well as through regular Bank loans. The Bank is also expanding economic work in the region and will help form additional consultative groups for effective participation by donor countries and agencies. In addition, the International Finance Corporation is expected to provide more support to the development of enterprises in the private sector.

*Woman winnowing maize in Banfora, Upper Volta. The World Bank has helped finance small-scale agricultural and rural projects in the country.*



# food supply in sub-Saharan Africa

more modern technology and better natural conditions—irrigation and double cropping—permit families to cultivate small plots very intensively. In Africa many times more land per capita is needed for survival. Against this measure, much of the region is already crowded: unless new technologies and practices evolve, agricultural output can no longer increase in proportion to additional agricultural labor.

This article presents an opposite argument: sub-Saharan Africa—given its present institutions and endowments of capital and technology—is already dangerously close to overpopulation. The rapid growth in numbers projected for the next decades will greatly increase human misery and depress rather than promote economic devel-

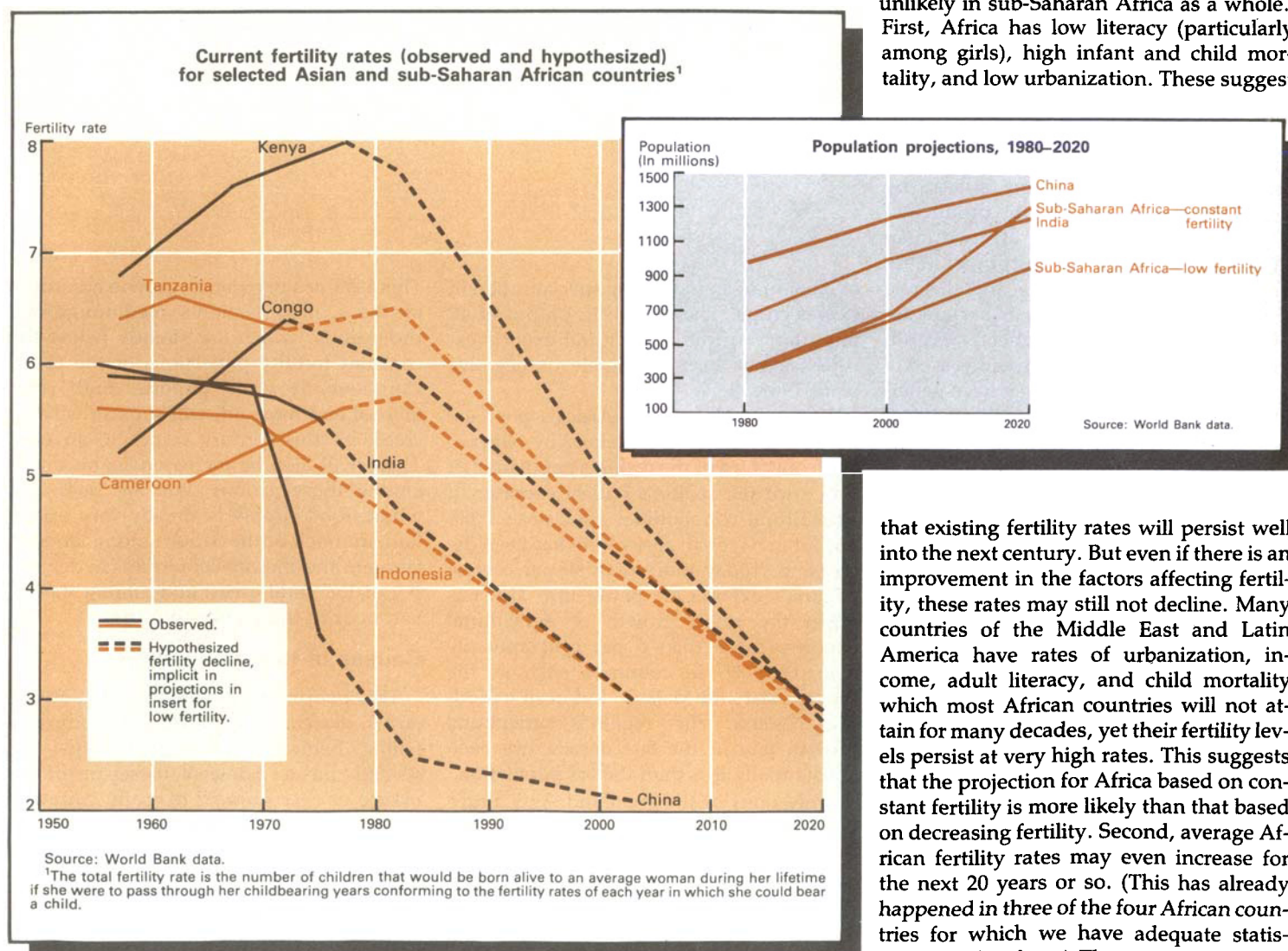
opment. Specifically, rapid population growth will have disastrous effects on the region's ability to increase exports and provide people with food. There must be a search for new ways in which these effects could be mitigated.

## Population trends

In many developing countries, fertility rates are falling; in some countries, notably China, Colombia, and Indonesia, dramatically. In sub-Saharan Africa fertility either continues to be very high or is increasing, in part due to some decline in traditional practices that reduce fertility, such as prolonged breast-feeding or sexual abstinence. This situation and the expectation of declining mortality, due to better health care,

imply that African population growth, which is already the most rapid in the world, may increase further. Population in sub-Saharan Africa is now about half that of India and a third of China (see chart). If fertility does not decline, in 33 years population will probably exceed that of India and be nearly equal to that of China. If fertility remains constant, in 40 years Kenya's population will increase five times, to 81 million; Nigeria's will increase four-fold, to 341 million. Even under the more optimistic assumption of declining fertility implicit in the second projection in the chart, African population will probably still be three quarters that of India by 2020.

There are two main reasons why reduced fertility in the next few decades is unlikely in sub-Saharan Africa as a whole. First, Africa has low literacy (particularly among girls), high infant and child mortality, and low urbanization. These suggest



that existing fertility rates will persist well into the next century. But even if there is an improvement in the factors affecting fertility, these rates may still not decline. Many countries of the Middle East and Latin America have rates of urbanization, income, adult literacy, and child mortality which most African countries will not attain for many decades, yet their fertility levels persist at very high rates. This suggests that the projection for Africa based on constant fertility is more likely than that based on decreasing fertility. Second, average African fertility rates may even increase for the next 20 years or so. (This has already happened in three of the four African countries for which we have adequate statistics—see the chart.) The reason for this is

that Africa, perhaps more than any other large region of the world, has had fecundity reduced in the past by poor health. Assuming incomes rise and better diets are possible in future, then health will improve, and both fecundity and fertility may rise.

Implicit in both constant and low projections is the assumption that African life expectancy at birth will increase substantially from the current 47 years, which is 10 years below the average for all low-income countries. Nevertheless, at the beginning of the twenty-first century, two thirds of sub-Saharan Africans would still have life expectancies below those of the average middle-income country in 1979. If mortality can be reduced more rapidly—and a successful effort is conceivable throughout the region—population growth would be even more rapid than that now forecast under the constant fertility projection.

### Food supply

What are the implications of continuing and rapid population growth for African food supply? The region's cereal production is largely restricted to four grains—millet, sorghum, maize, and rice; but the volume of grain production is less, by weight, than 60 per cent of the production of roots and tubers. There are two main differences between the output of these crops in sub-Saharan Africa and the rest of the world. First, yields per hectare are lower in Africa than elsewhere. Second, whereas yields elsewhere have increased in the last decade, in Africa they have generally been decreasing or largely constant (see the table).

In the 1960s, agricultural production in the region increased largely in tandem with population; both grew at about 2.3 per cent annually. In the 1970s, however, agricultural output actually decreased some 1.3 per cent a year, while population increased about 2.7 per cent a year. Food imports increased so rapidly that, by 1979, they absorbed more than 14 per cent of the foreign exchange generated by merchandise exports. Imported food grains (including food aid) represented 14 per cent of estimated grain production between 1977 and 1979. Since the urban population absorbed about 20 per cent of total production, and since most of the grain imported was consumed in the cities, it follows that food for African cities has been in large part imported. This growth of food imports is not a consequence of a more efficient division

Comparative yields of basic food crops, 1969–71 and 1977–79

	Sub-Saharan Africa <sup>1</sup>		Developing countries <sup>2</sup>		World	
	1969–71	1977–79	1969–71	1977–79	1969–71	1977–79
<b>Millet</b>						
Yield per hectare <sup>3</sup>	98	94	109	108	110	113
Comparative yield per hectare <sup>4</sup>	104	100	102	101	110	113
<b>Sorghum</b>						
Yield per hectare <sup>3</sup>	92	93	115	151	121	145
Comparative yield per hectare <sup>4</sup>	99	100	105	138	157	188
<b>Maize</b>						
Yield per hectare <sup>3</sup>	114	109	115	126	120	144
Comparative yield per hectare <sup>4</sup>	104	100	141	155	262	316
<b>Rice</b>						
Yield per hectare <sup>3</sup>	108	114	113	129	115	129
Comparative yield per hectare <sup>4</sup>	95	100	130	148	164	184
<b>Roots and tubers</b>						
Yields per hectare <sup>3</sup>	117	117	129	129	110	110
Comparative yield per hectare <sup>4</sup>	100	100	129	129	157	157

Source: World Bank, *Accelerated Development in Sub-Saharan Africa*, 1981, p. 169.

<sup>1</sup>Includes Angola, Benin, Botswana, Burundi, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo, Djibouti, Equatorial Guinea, Ethiopia, Gabon, The Gambia, Ghana, Guinea, Guinea-Bissau, Ivory Coast, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Niger, Nigeria, Rwanda, São Tomé and Príncipe, Senegal, Seychelles, Sierra Leone, Somalia, Sudan, Swaziland, Tanzania, Togo, Uganda, Upper Volta, Zaire, Zambia, and Zimbabwe.

<sup>2</sup>Includes sub-Saharan Africa.

<sup>3</sup>1961–63=100.

<sup>4</sup>Sub-Saharan Africa in 1977–79=100.

of labor or of an increasing specialization in export crops. The growth in output of all important African agricultural exports except tea has been negligible or negative since 1969–71.

Some of sub-Saharan Africa's poor export performance is explained by Nigeria. With one third of the region's population, it was once the region's largest exporter of agricultural commodities. But since 1960, output in Nigerian agriculture has been decreasing. Today more than 90 per cent of Nigeria's exports are petroleum. This has offset the rapid growth of agricultural exports—more than 6 per cent annually over 1969–79—in countries such as the Ivory Coast and Malawi. But even excluding Nigeria, the region's agricultural growth rate in the last decade has been substantially less than that of population.

Projections of the Food and Agriculture Organization (FAO) suggest that unless there is a very substantial increase in agricultural yields in Africa, the ratio of food produced to food consumed will decline from 86 per cent in 1975 to 70 per cent in 1990 and to 61 per cent in the year 2000.

This assumes population growth according to the United Nation's medium-growth projections, which are slightly below the constant fertility projections of the chart. Consequently, food imports, both commercial and food aid, will substantially increase as this century comes to an end. There will also be increased malnutrition among those groups who are poor and whose food supply is already very uncertain: in much of the Sahel; among landless laborers and the smaller farmers in densely populated rural areas; and among the urban poor in the poorer countries.

### Causes of low productivity

This performance—falling yields on the farms, decreasing exports, and production falling behind population growth—has several causes. Some of these are of the nature of *force majeure*; in many countries disruptive civil strife has been associated with reduced output. But a second cause lies in diminishing returns. Africa's traditional agriculture consists of shifting cultivation, long fallow periods, and very limited use of manure, agricultural support



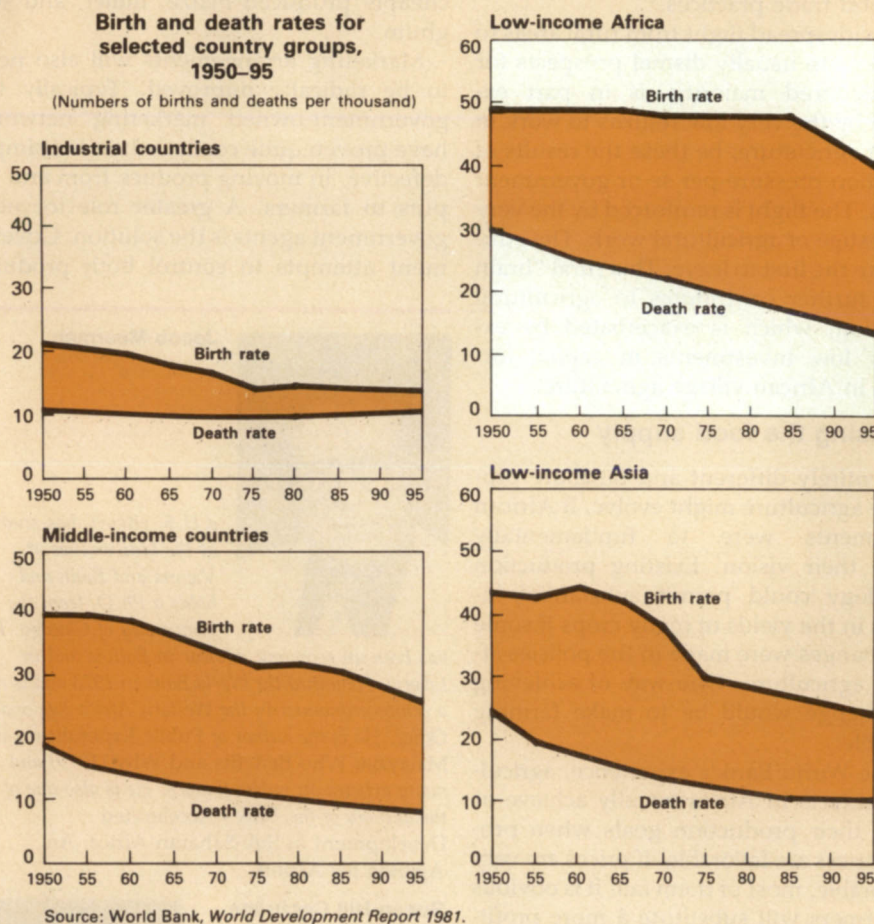
services, and supplies. Land has, until recently, been the abundant factor of production. Cultivable land, however, is becoming increasingly scarce. More marginal land has been brought under cultivation, either in zones of lower or uncertain rainfall or on slopes, and this has led to soil erosion and degradation.

Today, population pressure has brought diminishing returns to traditional agriculture in much of the Sahel and the savanna (Niger, Mauritania, the Mossi Plateau of Upper Volta, Senegal's northern groundnut basin, and northern Nigeria), in parts of East Africa (Burundi, Kenya, and Rwanda), Southern Africa (Lesotho, Swaziland, and Zimbabwe), and parts of the West African forest belt (southeastern Nigeria, northern Benin, the western highlands of Cameroon, and the Central African Republic near Bangassou). In these, and other areas, the long fallow period has been shortened, undermining the regenerative power of soils. Consequently, less nutritious crops, which can be grown on very impoverished soils, are more widely cultivated. In the last two decades, production of "inferior" staples such as roots and tubers has increased as rapidly as that of the preferred grains. Fuelwood has become harder to find while overgrazing and disputes between cultivators and pastoral people are more frequent. Moreover, population growth has undoubtedly affected exports, as potential exports such as groundnuts and palm oil are consumed to a larger degree at home. The African share in marketing of groundnut oil, palm oil, and palm kernel oil has dropped precipitously since 1960.

There is also the absence of the Green Revolution—the use of new high-yielding seeds and new technologies in agriculture that has led to dramatic increases in yields in most other parts of the world. This new knowledge—at least for food grains—is largely inapplicable in sub-Saharan Africa: high-yielding rice varieties from Asia are rarely productive in Africa because of plant diseases. And with the exception of the eastern highlands of Kenya, the diffusion of hybrid maize is limited because existing high yielding varieties are not suited to the ecology—the amount and variance in rainfall, sunlight, and transpiration—of most areas in Africa where maize is grown. Moreover, high-yielding technical packages—which combine seeds, fertilizers, and changes in modes of cultivation—have not been developed for African food

## The demographic transition

The demographic transition involves several steps. Initially life expectancy is increased as deaths from infectious diseases are brought down. This results in a continual drop in death rates over many decades. This effect has run its course in the industrial nations whose death rate has been about ten per thousand for many decades. Initially as death rates fall, birth rates—and fertility—continue very high. A population explosion is a consequence, since population growth is determined almost exclusively by birth rate minus death rate. Low-income Africa is at this stage. As modernization proceeds, birth rates decrease because couples reduce their fertility. Population growth diminishes. In many industrial countries the birth rate is now very close to the death rate and their populations soon may become stationary.



grains such as sorghum and millet. Other factors also serve to retard introduction of technical improvements, such as poor roads and marketing networks. Information services—radio, extension networks, written materials—are also very underdeveloped.

In addition to these long-term constraints on agriculture, pricing policy has frequently depressed production. The taxes on exports and other cash crops—including the depressing effects of surpluses collected by marketing boards and of overvalued exchange rates—frequently

exceed by more than half the value of the crop at the farm gate (that is, the export price less the costs of getting the crop from the farm to on board the ship). Governments have also subsidized the urban population's consumption of imported food grains, such as rice, wheat, and maize, by commandeering large quantities at low prices and in effect driving down the price and restricting the market for local foodstuffs. Frequently, some of the taxes on cash crops have been used for such subsidies. Even without financial subsidies on consumer prices, the widespread import of

grains is usually duty-free and often at a very favorable exchange rate; so the consumer gets them at a bargain price. The effect is low prices for agricultural products, which may penalize local production and retard investment and innovation. Farmers with low incomes simply cannot pay for the inputs which most innovations require for their adoption. In general, therefore, some of Africa's agricultural stagnation is caused by government price, fiscal, and trade practices.

The widespread flight from rural areas to the cities—to usually dismal prospects for the unlettered majority—is in part explained by the very low returns to work in peasant agriculture, be these the results of population pressure per se or government policies. The flight is reinforced by the very low prestige of agricultural work. The educated are the first to leave. This rural "brain drain" further contributes to agricultural stagnation, which is exacerbated by extremely low investments in capital formation in African village agriculture.

### Increasing the food supply

An entirely different and far more productive agriculture might evolve, if African governments were to fundamentally change their vision. Existing production technology could permit substantial increases in the yields of many crops if some basic changes were made in the policies affecting agriculture. One way of achieving such change would be to make farming profitable.

In the World Bank's experience, agricultural projects in Africa usually achieve or exceed their production goals when producer prices are favorable. If prices are very unfavorable, most of them fail. It is obvious that farmers will substitute a more profitable individual crop for a less profitable one. But there is also strong evidence that producers will gradually change long-run patterns of farming to make the most of opportunities for applying innovations and new technology in response to improved general terms of trade for agriculture.

But widespread basic changes are often extremely difficult to achieve. In many countries interest groups are both dependent on and a cause of very low returns to agriculture. For example, eliminating overvalued exchange rates and the mismatch between the structure of cereal demand (rice and wheat) and the structure of domestic supply (tubers, maize, and rough grains) is politically very hazardous be-

cause those most injured by such changes are predominantly the urban constituents from whom governments draw their basic support. Yet, if the very pessimistic import projections and tumbling ratio of domestic food production to imported food are to be avoided, the urban taste for imported wheat and rice—which now account for about 80 per cent of net commercial imports of cereals—will need to be curtailed in favor of the indigenous and far more cheaply produced maize, millet, and sorghum.

Marketing arrangements will also need to be radically improved. Typically the government-owned marketing networks have proven quite costly, when not simply defective, in moving produce from and inputs to farmers. A greater role for non-government agents is the solution. Government attempts to control both producer

and retail food prices will also have to be forgone. These controls and the de jure monopoly on trade that most governments have granted to the trading parastatals have resulted in parallel private markets all over the continent. But the potential that these institutions have for serving the public and reducing the burden on government through investment in transport and storage and a systematic approach to developing an adequate and low-cost supply network is much reduced because of uncertainties associated with the ambiguous position of private trade and traders.

Complementing this new approach to price policies and marketing should be a far greater emphasis on techniques to promote Africa's transition out of traditional, low-yielding, shifting farming systems. This implies more emphasis on agricultural research, to arrest the deterioration in the production of high quality seeds; on the operation of irrigation facilities; and on research to stem plant diseases. In addition, ideas on how best to modify traditional land tenure arrangements, so that farmers have an incentive to improve the quality of their soil, are needed to facilitate the introduction of innovations. The diffusion of small tools, such as donkey carts and hand sprayers, and productive inputs, such as pesticides and insecticides, must be encouraged. Here marketing can play an important role in introducing such new techniques. Highways also need to be repaired and extended. Finally, new basic research to develop higher-yielding food grains and techniques for maintaining soil fertility without fallow periods requires far more attention.

Success here could bring rapid growth in agriculture, which would also bring very rapid growth in effective demand by farmers for the output of other sectors in the economy. That would stimulate development in general.

Development of agriculture will also mean increasing production for export. In some countries strong emphasis on export crops may be desirable. In many countries, hitherto, such emphasis has also been associated with increased production of food crops because the marketing arrangements, infrastructure, and other investments that promoted export production also supported expanded food production. This outcome is not a necessary one, however, particularly if good land is in short supply. In some cases development of agriculture may be most effective through in-



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Photos by Giuseppe Francini for F&D

creasing production primarily for export and using some of the proceeds to import food produced more cheaply elsewhere.

### Family planning

The effect of population growth in diminishing returns to agriculture also lends urgency to the need for family planning. The question facing policymakers in sub-Saharan Africa is not whether or not population will grow—it will grow rapidly—but when growth rates will slow. Experience in Asia and Latin America shows that both development and family planning programs can reduce fertility. China and Indonesia are examples of fertility declines far more rapid than those predicted on the basis of literacy, mortality, and income. In these countries governments have accelerated the demographic transition to lower population growth rates by many means, including increasing access to modern contraceptives, mass education campaigns, and, in China, raising the marriage age.

In 1975, only 8 African countries had even weak family planning programs; they were rarely subsidized by their governments. Today 22 of the 37 African countries for which data are available support family planning. Nevertheless, there is little sense of urgency to the programs; nor have techniques or approaches been worked out that would be most suited to African circumstances. Emphasis on child-spacing may be one such approach. Child-spacing as a way to increase the chances of a child's survival is a basic and nearly universal ethic in African villages. It has always been accomplished through prolonged breast-feeding and sexual abstinence. Today, however, there is some use of contraceptives to ensure the required spacing. Thus the traditional ethic provides a rationale for incorporating family planning within maternal and child health programs.

In general, population policy in Africa badly needs strengthening. This could be done in many ways. Family-planning advice could be recognized as the right of every couple, and providing such advice to all who desire it could be a pronounced basic goal of every government. Governments can encourage widespread family-planning services and supplies, including the availability of cheap or even free contraceptives. Family-planning components can be built into national health care systems to ensure that improved child survival and fertility regulation can be better synchronized. But without increased female

education and reduced infant and child mortality, the impact of spacing alone on fertility will be limited. Thus both development and family planning have a role in reducing fertility rates.

### A wider problem

In a sense most of the villages of tropical Africa have been suffering from overpopulation for many decades: notwithstanding abundant but not very productive land, in much of the region most villages barely produce enough to feed themselves. Droughts that cause food shortages and even famine are common occurrences. Diet is frequently very poor in general, and in particular during the weeks before the new harvest, and infant and toddler mortality is higher than anywhere else. Poor diet is one reason why dysentery and measles regularly kill malnourished African children.

Population growth in the next decade can only make this situation worse. But the implications for education—an area in which African governments have achieved impressive results and which affects all these sectors—are also serious. To maintain primary school enrollment at the current rate of 65 per cent (which still means an increasing number of unschooled every year) will require increased government expenditures for primary education at about 3.5 per cent a year. To achieve universal primary education by the year 2000 would require expansion at over 6 per cent annually, far beyond the region's capacity. Urbanization will also be a very serious problem. In 35 major capitals, population growth now averages about 9 per cent annually, a rate at which cities double in size every nine years. There are now 28 African cities with populations over half a million. Just 20 years ago there were but three. The urban population will quadruple again in the next quarter century. The majority in these cities will continue to live in slums, usually an entire family (or more) per room, with high rates of disease, little access to public services—good water, sanitation, and medical care—and extremely long journeys to and from work.

Improvements in two areas—breaking the chain of population growth and stagnating agriculture—would help reduce human misery in sub-Saharan Africa. The desired changes can become reality if enough resources, primarily African but also from outside the region, are brought to bear; and if African governments incorporate the needed policies into their political systems.

### Related reading

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Timothy King and others, *Population Policies and Economic Development* (World Bank, Washington, DC, 1974).

U.S. Department of Agriculture, *Food Problems and Prospects in Sub-Saharan Africa, The Decade of the 1980's*, Foreign Agricultural Research Report No. 166 (August 1981).

World Bank, *Accelerated Development in Sub-Saharan Africa: An Agenda for Action* (World Bank, Washington, DC, 1981).

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