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A WORLD BANK POLICY STUDY

# Population Growth and Policies in Sub-Saharan Africa



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*The World Bank  
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## *Foreword*

The population of Sub-Saharan Africa, currently about 470 million, will exceed 700 million by 2000. At no time in history has any group of nations faced the challenge of development in a situation of such rapid population growth. Since achieving independence, the governments of African nations have committed domestic resources to programs designed to raise people's living standards; external sources have assisted in this effort. But internal economic distortions and external shocks have slowed growth in per capita income and in some countries have prevented any growth at all in recent years. Faulty trade and agricultural pricing policies, mounting fiscal deficits, and price declines of critical exports have all exacted their penalty: stagnation or, at best, sluggish economic growth.

Eliminating policy-induced economic distortions is a principal concern that was addressed in a recent World Bank study, *Financing Adjustment with Growth in Sub-Saharan Africa, 1986–90*. But better economic policies need to be complemented by action to relax the long-term constraint of rapid population growth. Until just a few years ago, African governments viewed rising populations as no problem at all or even, in a few cases, as an economic and political asset. That situation is rapidly changing. Today, many African governments, concerned that explosive population

growth impedes their efforts to raise living standards, are developing policies intended to slow population growth. But although official views are changing, in many countries there is still not enough appreciation of the urgency of the population problem among government officials and the public at large.

This report is a response to the changing policy environment in Africa. It provides the necessary framework to help Africans first to recognize the complexities of the population issue and then to design approaches to tackle those problems in a manner appropriate to the needs and resources of their own countries. The report is addressed to a broad African audience—not just policymakers in the narrow sense of top government officials, but the wider community of technical experts, administrators, academics, and opinion leaders.

The report provides a comprehensive picture of the magnitude and underlying causes of Africa's rapid population growth. It emphasizes that this rapid growth is neither desirable nor necessary. A strong government commitment to the legitimacy of family planning, combined with relatively modest financing of basic health and family planning programs, could tap the growing demand among Africa's peoples for the means to plan the number and spacing of their children. The report presents new evidence of unmet demand for family plan-

ning in Africa, even among the poor, and suggests that a contraceptive prevalence rate of 25 percent is attainable in the next decade—a prevalence rate that could reduce the rate of population growth by more than one percentage point.

But to achieve such a reduction in population growth, governments must take the lead in generating a climate of legitimacy for family planning, in encouraging public education, and in testing new program initiatives. At the same time, the governments need to avoid becoming in the longer term the sole or even principal providers of family planning services. There is an important and expanding role for nongovernmental organizations and, more broadly, the private sector in all aspects of population and family planning services.

The direct costs of programs to reduce fertility are not large. Assuming that 25 percent of couples are using contraceptives and that the cost is \$20 per active user (less than \$1 per capita), annual total program operating costs would rise from \$100 million now to about \$640 million in 2000. One-half of the \$100 million spent today in Sub-Saharan Africa is externally funded; that \$50 million constitutes less than 1 percent of total official development assistance of \$7 billion. To maintain a half-share of population spending given the much higher total program costs projected for 2000, official external assistance would have to

increase six- or sevenfold. But this would involve only a small reallocation, even at the current level of total development assistance.

For its part, the World Bank is rapidly increasing its own population and related health lending, as promised at the United Nations International Population Conference in Mexico City in 1984. Through 1982 the World Bank had committed \$35 million in population and health assistance to Sub-Saharan Africa (in two population projects in Kenya). It has since committed \$170 million to health projects which include family planning as a basic health service in Botswana, Comoros, Malawi, Mali, and Senegal and to health and population projects in Burkina Faso, Ghana, Lesotho, Niger, Nigeria, and Rwanda.

We expect to expand lending further for health and population projects, both in amount and in country coverage, over the next four years. Our hope is that the rest of the donor community will join with the Bank in responding to the increasing requests from Sub-Saharan Africa for population assistance as a small but essential component of development assistance.

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July 1986

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## *Definitions*

### **Demographic Terms**

*Child death rate.* The number of deaths of children aged 1 to 4 in a given year per thousand children in this age group.

*Cohort.* A group of people sharing a common temporal demographic experience who are observed through time. For example, the birth cohort of 1900 would be the people born in that year. There are also marriage cohorts, school class cohorts, and so on.

*Completed fertility rate.* The number of children born alive per woman in a cohort of women by the end of their childbearing years.

*Contraception.* The conscious effort of couples to avoid conception through rhythm, withdrawal, abstinence, male or female sterilization, or use of contraceptives: intrauterine device (IUD), oral contraceptives, injectable contraceptives, condom, spermicides, and diaphragm.

*Contraceptive prevalence rate.* The percentage of married women of reproductive age who are using (or whose husbands are using) any form of contraception.

*Crude birth rate.* The number of births per thousand population in a given year.

*Crude death rate.* The number of deaths per thousand population in a given year.

*Dependency ratio.* The ratio of the economically dependent part of the population to the productive part; arbitrarily defined as the ratio of the young

(those under 15 years of age) plus the elderly (those 65 years and over) to the population in the “working ages” (those 15 to 64 years of age).

*Family planning.* Conscious effort of couples to regulate the number and timing of births.

*Family planning programs.* Programs that provide information about, and services for, use of contraception.

*Fecundity.* The physiological capacity of a woman, man, or couple to produce a live birth.

*Fertility.* The reproductive performance, measured by number of births, of an individual, a couple, a group, or a population.

*Infant mortality rate.* The number of deaths of infants under one year old in a given year per thousand live births in that year.

*Life expectancy at birth.* The average number of years a newborn would live if current age-specific mortality were maintained. Life expectancy at later ages is the average number of years a person already at a given later age will live. Life expectancy at age 5 and above can exceed life expectancy at birth substantially if the infant mortality rate is high.

*Married women of reproductive age.* Women who are currently married, or in a stable sexual union, generally between the ages of 15 and 49. Some analysts count only women between the ages of 15 and 44.

**Maternal mortality rate.** The number of deaths of women due to complications of pregnancy and childbirth per hundred thousand live births in a given year.

**Mortality.** Deaths as a component of population change.

**Net reproduction rate.** The average number of daughters that would be born to a woman (or group of women) if during her lifetime she were to conform to the age-specific fertility and mortality rates of a given year. This rate takes into account that some women will die before completing their childbearing years. A net reproduction rate of 1.00 means that each generation of mothers is having exactly enough daughters to replace itself in the population.

**Parity.** The number of children previously born alive to a woman.

**Population growth rate.** The rate at which a population is increasing (or decreasing) in a given year owing to natural increase and net migration, expressed as a percentage of the base population.

**Population momentum.** The tendency for population growth to continue beyond the time that replacement-level fertility has been achieved because of the large and increasing size of cohorts of childbearing age and younger, resulting from higher fertility and/or falling mortality in preceding years.

**Rate of natural increase.** The rate at which a population is increasing (or decreasing) in a given year due to a surplus (or deficit) of births over deaths. The rate of natural increase equals the crude birth rate minus the crude death rate per hundred people. It also equals the population growth rate minus emigration.

**Replacement-level fertility.** The level of fertility at which a cohort of women on the average is having only enough daughters to “replace” itself in the population. By definition, replacement level is equal to a net reproduction rate (see above definition) of 1.00. Replacement-level fertility can also be expressed in terms of the total fertility rate. In the United States today a total fertility rate of 2.12 is considered to be replacement level; it is higher than 2 because of mortality and because of a sex ratio greater than 1 at birth. The higher mortality is, the higher is replacement-level fertility.

**Total fertility rate.** The average number of children that would be born alive to a woman (or group of women) during her lifetime if during her childbearing years she were to bear children at each age in accord with prevailing age-specific fertility rates.

**Urbanization.** Growth in the proportion of the population living in urban areas.

## Acronyms and Abbreviations

AVS	Association for Voluntary Sterilization	ODA	Official development assistance
CPS	Contraceptive Prevalence Surveys	PC	Population Council
FPIA	Family Planning International Association	UNICEF	United Nations Children's Fund
FAO	Food and Agriculture Organization	UNFPA	United Nations Fund for Population Activities
GDP	Gross domestic product	USAID	U.S. Agency for International Development
GNP	Gross national product	WFS	World Fertility Surveys
IPPF	International Planned Parenthood Federation	WHO	World Health Organization
NGO	Nongovernmental organization		

## Data Notes

- *Sub-Saharan Africa*, the subject of this report, is defined as the forty-seven countries south of the Sahara (including South Africa), Sudan, and the British dependency of St. Helena.
- *Short-term*, in demographic analysis, is defined as twenty-five years—approximately the length of one generation.
- *Billion* is 1,000 million.
- Growth rates are in real terms unless otherwise stated.
- Dollars are U.S. dollars unless otherwise specified.
- The demographic analysis in this report is based on data prepared for the *World Development Report 1985*. Data for a few countries are different in the *World Development Report 1986*. The numbers shown for historical data may differ from those in previous World Bank documents because of continuous updating.

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## *Introduction and Summary*

The urgency of Africa's needs has generated concern not only in Africa itself but throughout the world. Today Africa is the poorest continent and its population is increasing at an unprecedented rate. Development must proceed at an extraordinary pace if per capita welfare is to be improved.

Sub-Saharan Africa has vast human and physical resources and potential for development. To fulfill that potential, both an immediate response to today's crises and sustained efforts to ease the longer-term constraints on development are required. Life for the majority of Africa's people can then improve. Such efforts include adopting more efficient economic policies, giving higher priority to agriculture, and reducing high levels of fertility so that population growth subsides. They were described in detail in the World Bank's 1984 report, *Toward Sustained Development in Sub-Saharan Africa*. The present report focuses on the economic consequences of rapid population growth in Africa and on policies and programs to reduce population growth.

In 1984, in preparation for the United Nations International Population Conference in Mexico City, African governments agreed on the Kilimanjaro Program of Action on Population (see Box 1). This program emphasized that "current high levels of fertility and mortality give rise to great concern about the region's ability to maintain even living

standards already attained since independence" and recommended that measures to address population growth and distribution should be a central component of efforts to accelerate development.

This declaration can be contrasted with the position taken by many Sub-Saharan governments at the 1974 World Population Conference in Bucharest. At that time only three African governments (Botswana, Ghana, and Kenya) sought to slow population growth. Only half of the Sub-Saharan countries supported family planning, even as a health measure, and no country provided extensive family planning services. Today, more than three-fourths of Sub-Saharan governments officially support family planning.

This report is meant to respond to this change in policy. It has three main themes.

### **Population Growth and Development**

The first theme is one of deep concern that rapid population growth in Africa is slowing development and sharply reducing the possibility of raising living standards. Between 1970 and 1982 the gross domestic product (GDP) for Sub-Saharan Africa grew at about 3 percent a year, at roughly the same pace as population, so that there was virtually no improvement in per capita incomes for the region as a whole. (Indeed, per capita incomes de-

### **Box 1. The Kilimanjaro Program of Action on Population**

Representatives from most African governments met at the Second African Population Conference, sponsored by the United Nations, in Arusha, Tanzania, in January 1984. The participants reviewed progress in implementing the World Population Plan of Action of 1974 and made preparations for the U.N. International Population Conference in Mexico City in August 1984. It formulated ninety-three recommendations, including the following.

#### **To African Governments**

##### ***Population and development strategy and policy***

1. Population should be seen as a central component in formulating and implementing policies and programmes for accelerated socio-economic development plans.
7. National efforts to create greater awareness of the interrelationships between population and development should include the provision of greater information to politicians and policy-makers and the public on the dynamics of population change and the impact of such change on current and future development.

##### ***Fertility and family planning***

17. Governments should take appropriate measures to protect and support the family which is the basic unit of society.
20. Countries are urged to incorporate family planning services into the maternal and child health services.
23. Governments should ensure the availability and accessibility of family planning services to all couples or individuals seeking such services freely or at subsidized prices.
29. In view of current low mean ages at first marriage for females, national programmes, especially in education, should aim at raising the age at marriage.

##### ***Morbidity and mortality***

31. African countries should intensify national programmes to reduce current high levels of infant, childhood, and maternal morbidity and mortality, especially for mothers and children in rural areas.

##### ***Changing role of women in the development process***

50. Governments should pursue more aggressively action programmes aimed at improving and protecting the legal rights and status of women.
54. Governments should promote education for women especially and provide special population education and information programmes in the areas of fertility, mortality and high risk pregnancies.

##### ***Children and youth***

63. Population and family life education should be incorporated into formal and vocational training to assist young people to prepare themselves for responsible parenthood.

##### ***Community involvement and role of private and non-government organizations***

82. Governments are urged to give due recognition and support the contribution of private and non-governmental organizations participating in population activities in their respective countries.

##### ***To Donor Governments and Agencies***

91. Donor governments and agencies are urged to continue to provide increased financial and technical support to African countries in their population programmes in the context of their material needs and priorities.

clined, since the terms of trade worsened for Africa as a whole.) GDP grew even more slowly in the poorer countries. Other regions of the developing world, with comparable rates of economic growth but slower population growth, had increases in per capita income. In 1982 per capita income averaged less than \$500 in Sub-Saharan Africa and about half that level in half the countries.

Elsewhere in the developing world population growth rates are now falling. But Africa's popula-

tion growth rate has accelerated recently, from an average of 2.8 percent a year for 1970–82 to 3.1 percent a year in 1985, and is now the highest in the world. Population growth rates for individual countries vary, but about half fall in the 2.7–3.5 percent range, while a few have much higher rates. In most countries with lower rates—for example, Chad, Guinea, Sierra Leone and Somalia—population growth is less rapid not because fertility is lower but because mortality is higher.

Moreover, without specific efforts to reduce birth rates, population growth could actually accelerate in many countries. Although death rates in Africa declined by about one-third between 1960 and 1980—a major achievement—they still exceed 15 per thousand population in most countries, compared with 7–8 per thousand in China, Mexico, the Philippines, and Thailand. Barring catastrophes, they should go on falling as food supplies improve and access to education, safe water, sanitation, and health services expands. At the same time, birth rates could rise in some countries as maternal health improves; in only two countries (Botswana and Zimbabwe) do they show signs of beginning to fall. Thus, population growth rates for some countries may rise for some time and are unlikely to stabilize, let alone fall, for at least five to ten years. For Sub-Saharan Africa as a whole, the World Bank's standard projections show population continuing to grow at 3 percent a year until nearly the end of this century, from about 460 million in 1985 to 730 million by 2000 and 1.8 billion by 2050. (This projection assumes continued socioeconomic progress, some acceleration in efforts to encourage family planning, and thus a decline in fertility beginning in the next five to ten years. A more concerted effort in family planning could mean a faster fertility decline and could make a substantial difference, particularly after 2000.)

Why is this rapid population growth a problem? In any country, per capita income will rise only if people can be equipped to work more productively—only if human capital (health and skills), physical capital, and natural resources can be amassed faster than the population grows, or if technical change permits more efficient use of available resources. But in Africa today population is growing so fast that even a high growth rate of human and other complementary resources—comparable to the rate achieved by developed countries during the past fifty years—would not be enough to sustain a significant rise in per capita incomes. Since independence in Sub-Saharan Africa, many nations have undertaken extensive development efforts. But initial conditions—lack of infrastructure, lack of education, and poor health as nations emerged from the colonial era—have put limits on the productivity of additional investments. Developments in the international economy in the past decade have compounded what have

been, in some countries, poor economic policy choices. Rapid population growth has added to these other difficulties.

A rapidly growing population means more than a short-term sacrifice of per capita income growth. It can mean loss of long-run potential for higher economic growth and rising living standards: higher maternal and child mortality and morbidity; further degradation of the natural environment where there is already population pressure; tighter constraints on extending education and basic health care beyond current rudimentary levels; and falling wages as the labor force grows more rapidly than complementary investments.

According to an FAO study (Higgins and others 1982), Africa's land could in theory support several times the present population at adequate nutritional levels. That would, however, entail substantial migration within countries and across international borders from more populated to less populated areas. It would also require investments in irrigation, new technology, and assistance to small farmers on a scale that is unlikely to be achieved soon. Just to sustain the inadequate current standards of nutrition, agricultural production in Africa would have to grow at a sustained rate of over 3 percent a year for the next twenty years. Improvement of agricultural policies will help; in some countries that rate of agricultural growth is not impossible. But for the region as a whole, such growth is unlikely. Only a few countries, all outside Africa, have achieved growth rates in agriculture above 3 percent a year for sustained periods. Agricultural production in Sub-Saharan Africa grew at 2.5 percent a year in the 1960s and at 1.4 percent in the 1970s. Unless other sectors of the economy grow even faster, allowing for the purchase of food, Africa will have to rely more and more on food aid. Meanwhile, rapid population growth itself contributes to permanent loss of forests and other resources as a result of overexploitation. Resources held in common are especially vulnerable to such overexploitation. High and rising prices of fuelwood in urban areas reflect the problem and place heavy burdens on the poor; in some cities of Africa, spending on fuelwood now claims up to 20 percent of the income of poor households.

Even in countries with plentiful land, no short-term lack of natural resources, and relatively good agricultural prospects, rapid population growth can slow development by making it difficult to sus-

tain adequate investments in education and health care. Most Sub-Saharan countries face at least a doubling of their school-age populations in the next two decades. Many, such as Benin and the Côte d'Ivoire, currently spend 40 percent of their total recurrent budgets on education yet have enrollment ratios of 75 percent or less for primary school and less than 25 percent for secondary school; several more spend around 30 percent on education. According to rough projections, the cost of attaining universal primary education and rudimentary health services in fifteen years could reach as much as half the total expected government revenues in many African countries—nearly twice their current share.

The employment and wage situation is also grim. The prospects for even modest gains in average earnings rely on agricultural production growth rates of at least 3 percent a year and industrial growth rates above 7 percent a year over the next twenty years. If short-term economic policy reforms are adopted, these growth rates are possible for some countries, but they will bring only small gains in average living standards in the next two decades.

Given the short-term prospect of inevitable continuing rapid increases in population, a comprehensive population policy in African countries must include, in addition to efforts to slow population growth, policies to cope with the consequences of this growth. To a large extent these policies fall under the rubric of general development policies that encourage optimal use of resources in agriculture, urban development, and so on. These general policies are not discussed below, but this is not to suggest they are not important. Indeed, many of the problems of rapid population growth are compounded precisely because adjustments in other sectors are hampered by policies that provide poor signals to individual economic agents. Rapid population growth only underlines the need in all sectors for economic and social policies that encourage growth as efficiently as possible.

### **Changes in Attitudes toward Family Planning**

The second theme is one of cautious hope arising from recent evidence of change in ideas and behavior regarding fertility. In Africa, as elsewhere, poor

people find it in their interests to have large families. Children provide reliable help around the farm and support and protect their parents in old age. Persistent child mortality strengthens demand for large families, to ensure that some children—especially sons—will survive. Powerful pronatalist forces are built into African kinship systems and into traditional relations between men and women and young and old. Women marry early, and their status in traditional communities is tied closely to their fertility. The costs of children are lower to men than to women, and to the extent that men dominate the decision to have another child, fertility is likely to remain high. Women may recognize the costs of high fertility to their own and their children's health; men, less involved in the care of children, may not. This may be the case in polygamous households, in which each wife has primary responsibility for her own children. Extended families, in which the costs of high fertility are widely shared and are only partly internalized by the couple that makes the fertility decision, may also encourage high fertility. Finally, until very recently modern contraception was not encouraged by governments. The idea of controlling one's own fertility hardly existed, and doing so often brought social disapproval. The overall result is that most African couples want and have large families. Total fertility rates exceed six children in most Sub-Saharan countries, and in many countries desired family size exceeds seven children.

But the situation is changing rapidly. More and more governments are expressing concern, and the idea of family planning is gaining acceptance. Education of women is increasing—between 1970 and 1980 the enrollment rate of girls in primary schools in Kenya jumped from 50 to 95 percent. As a result, the average education of young people of childbearing age is rising. Higher educational levels are likely to reduce fertility. In the ten African countries for which data are available, desired family size among women with seven or more years of education averages about five children, compared with almost eight children among women with no education. In those countries less than 1 percent of women with no education use modern contraception, but 11 percent of women with at least seven years of education do.

Other conditions are also changing. In a few countries, primary health care is now expanding rapidly. Better health care can reduce infant mor-

tality and address the problem of infertility, which in some parts of Africa discourages any interest in fertility control. Continuing urbanization is loosening extended family ties and raising the private costs of children to couples who are less tied to extended family networks. Laws and regulations are being altered to improve the status of women (in Kenya, legal changes now allow women to inherit land). Raising women's status will help free them from the traditional roles that encourage high fertility and deny society the benefits of their potential contribution. It requires opening up economic opportunities—not only rights to land, but also improved access to credit, agricultural extension services, and training.

There are hopeful signs that attitudes toward family planning are changing and that there is short-run potential for the success of organized family planning programs in Africa. A few countries have recorded increases in contraceptive use; in Zimbabwe services have expanded rapidly in the past five years and contraceptive use has more than doubled, from 10 percent to over 25 percent. In many African cities evidence of increasing rates of induced abortion implies substantial latent demand for modern contraception. Even within the context of traditional norms there is considerable untapped scope for progress in regulating fertility. Programs to support use of modern family planning can build on a long-standing African tradition, now breaking down, of spacing births through breastfeeding and sexual abstinence to give mother and baby a good start. Large potential health gains from family planning, now better understood than they were twenty years ago, are naturally appealing to policymakers and people; spacing births by two years or more would by itself reduce infant mortality by 12–20 percent in much of Africa. Finally, relatively new methods of delivering family planning services, including "outreach"—the use of paramedical and nonmedical workers to take information and services directly to the people—have already been shown to be workable and to make a difference in parts of Africa.

On the basis of experience in Zimbabwe and in parts of Kenya, it is possible that making services widely and regularly available could raise contraceptive prevalence rates in Africa to 25 percent in the next decade, compared with 3–4 percent today. In parts of the world where only 3–4 percent

of couples practice family planning birth rates are about 45–50 per thousand population; where about 25 percent do, birth rates drop to 35–40 per thousand. The task is, however, a large one. This brings us to the third theme.

### **Reorientation of Government Involvement**

The third theme is a practical one: if progress in population policy is to be rapid and programs are to expand steadily, some strategic reorientation of the direction and nature of government involvement is needed. The commitment of government leaders to the development of population policy must extend beyond lip service and be translated into effective action. Except in a few countries, the potential demand for family planning services has hardly been tapped. Among Sub-Saharan countries today, only Zimbabwe provides substantial access to family planning for those outside urban areas. Botswana and Kenya have programs well under way, but actual access by potential clients remains limited. Several other countries—for example, Ghana, Liberia, Malawi, Nigeria, Rwanda, and Tanzania—have started programs but have made only limited progress to date. In most countries, what services exist are provided in limited areas by small nongovernmental organizations that are often poorly funded. Rapid expansion of family planning will require constant reassessment of conventional approaches to family planning programs in the light of Africa's needs. Information and services need to go not only to married women who already have a few children but also to men, unmarried and newly married youths, and older women who wish to cease childbearing altogether. The choice of contraceptive methods must be broadened; restrictions on the use and provision of injectables and of sterilization can be eased. Community-based distribution and other approaches that do not rely on highly trained staff in conventional clinic-based settings need to be tried.

Even as governments take the lead in generating a climate of legitimacy for family planning and in initiating such program changes as wider contraceptive choice, they must deliberately avoid monopolizing the provision of family planning services. Governments in Africa are increasingly accepting the notion that they need not and should not do everything. The same principle should ap-

ply to population policy: governments need not and should not try to be the sole providers of family planning services.

There is an option for a distinct African approach—a deliberate fostering of pluralism in efforts to extend access to family planning information and services through the encouragement of local government, community, and private initiatives. The viability of such an option is supported by the successful involvement, although to date on a relatively small scale, of nongovernmental groups in family planning in Africa. Fostering pluralism does not mean that the government plays no role. Rather, it entails a broad agenda of activities to facilitate local and private initiatives and learn from them. It involves difficult choices about how and where to expend the limited technical and administrative resources of the government. Nor can it be a license for the government to take no specific initiatives. The government must take the lead in promoting dissemination of information about family planning and developing a social consensus on its legitimacy. Especially in rural areas, where the government is the major provider of modern health care and specifically of maternal and child health services, the public sector may have to be the principal provider of services for some time to come.

The cost of providing family planning in Africa is not great in absolute terms, but it will not be easily met by domestic resources. The cost of family planning services, including some basic maternal and child health care, ranges between \$20 and \$50 a year per active user. Average costs fall as services improve and contraceptive prevalence rises toward 20 percent of couples of reproductive age. A long-run figure of \$20 per user implies about \$0.75 per capita spending for the population as a whole, assuming that about 25 percent of eligible couples use family planning. African governments now spend between \$3 and \$15 per capita on health as a whole; in this context, to achieve spending of \$0.75 per capita specifically on family planning within the next decade is a reasonable goal. (In the same period, spending on health ought also to increase.) An increase in external assistance not only for family planning but also for policy planning, data collection and analysis, and training will be necessary for several decades if

family planning is to be a realistic option for Africans, as it is for most people elsewhere.

The World Bank believes that population assistance to Africa from all external sources of finance should increase in the next decade as rapidly as the capacity to absorb funds allows. Given the limited capacity of most African governments to finance new programs, and the critical need, it is not unreasonable that 50 percent of population program costs should be financed externally over the next decade. The same can be said of related health programs. Even a tripling of the external assistance currently spent on population—from \$53 million to \$160 million—would imply an increase in assistance from \$0.12 to just \$0.36 per capita—half the \$0.75 figure mentioned above as a goal for overall spending.

For its part, the Bank views population assistance as its highest priority in Africa. It will increase its spending as rapidly as programs can be developed. Indeed, the capacity to launch new programs is the only constraint on new Bank financing. The Bank recognizes that not all new programs will succeed; some failures are likely with rapid growth in a new program area, but failures today can provide lessons for tomorrow's successes. The Bank will put more stress on population issues in its policy dialogues with member governments and in research. It will encourage expansion of basic health services, female education, and other development programs that generate demand for smaller families. It will strive to double its own lending for population and related health programs in Sub-Saharan Africa in the next three years and will respond flexibly to requests from African governments for funding of contraceptives and some recurring costs and for training, clinic construction, information programs, and technical assistance. The Bank will promote closer cooperation among developing countries and external sources of finance to ensure more effective use of resources and encourage fuller response to government requests for assistance. Together with many African governments, the Bank believes that slowing population growth in the next few decades—as part of broader development strategies—can help to relieve poverty and raise living standards for Africa's people. Without such efforts, those standards will remain under threat.

# 1

## *Patterns of Population Growth*

This chapter describes Africa's current demographic situation and presents projections of demographic change in Africa up to 2050. Demographic data in Sub-Saharan Africa, although still scarce and of modest quality, have improved greatly in recent years. Most countries have had a modern census, and the recent World Fertility Surveys have provided details on fertility and mortality in ten countries (Benin, Cameroon, Côte d'Ivoire, Ghana, Kenya, Lesotho, Mauritania, Nigeria, Senegal, and Sudan). Enough information is available to describe Africa's overall population size, fertility and mortality levels, and rate of population growth. But the detailed data needed for population and socioeconomic planning are still lacking in most countries.

### **Demographic Overview**

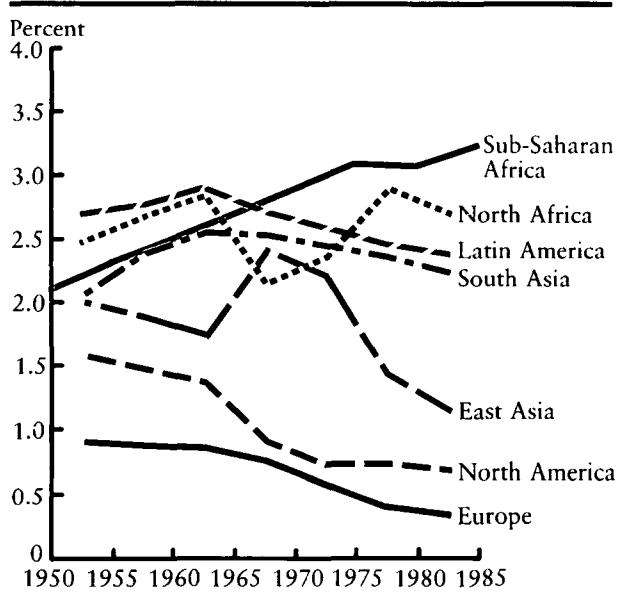
Sub-Saharan Africa is a mosaic. It has 459 million people divided into over 800 ethnic groups. By world standards, nearly all African countries have small populations. Only six (Ethiopia, Kenya, Nigeria, Sudan, Tanzania, and Zaire) exceed 20 million; except for Ethiopia and Nigeria, with about 42 and 100 million, respectively, none exceeds 35 million. Three-fourths of Sub-Saharan countries have fewer than 10 million people, and nearly half have fewer than 5 million.

### ***Population Growth***

The rate of population growth in Sub-Saharan Africa is extraordinarily rapid. Africa is now the only region that has not experienced a fall in population growth rates. Apart from a brief baby boom after World War II, growth rates in the industrial countries have been declining for decades and in some countries are at or below zero. The population growth rate for Latin America peaked at 2.9 percent a year in the early 1960s and has now fallen to 2.4 percent; the rate for South Asia rose a little above 2.5 percent in the late 1960s and has since fallen to 2.1 percent. Only in Sub-Saharan Africa are growth rates still rising, from 2.5 percent a year in 1960 to 3 percent a year in 1983 (see Figure 1). If this rate were to continue, Sub-Saharan Africa's current (1985) population of 459 million would double in just twenty-two years.

Africa's rapid population growth results from a steady fall in death rates and no fall—indeed, in some countries an increase—in birth rates. As Figure 2 shows, in the past twenty years the average crude death rate for all Sub-Saharan Africa fell by one-third, to 15.9 per thousand—in itself a success. Yet the average crude birth rate changed hardly at all. By contrast, birth rates as well as death rates declined in all other continents. Table 1 shows current levels for African and other selected

**Figure 1. Population Growth Rates, Selected Regions, 1950–85**

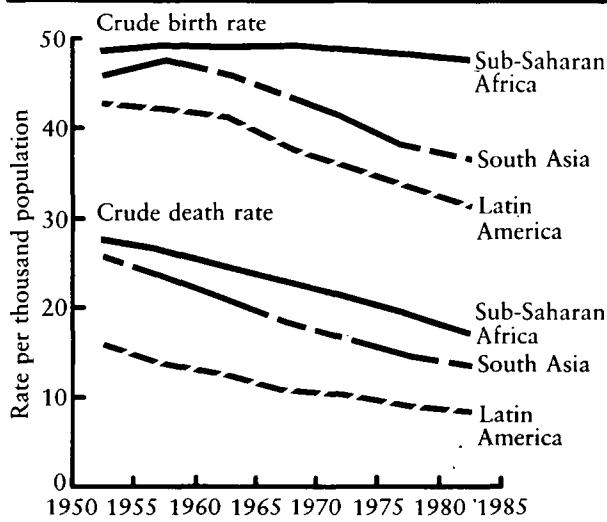


Source: Data base for *World Development Report 1985*.

countries. In Africa birth rates are almost all very high; death rates vary more but, compared with non-African countries, are not particularly low.

Over the past forty years life expectancy has risen substantially in Africa, to an average of about 50 years at birth. In the 1950s life expectancy of under 40 years, with corresponding infant mortality rates of 200 or more, was common; life expec-

**Figure 2. Crude Birth and Death Rates, Selected Regions, 1950–85**



Source: Data base for *World Development Report 1985*.

**Table 1. Birth Rates, Death Rates, and Rates of Natural Increase in Selected Sub-Saharan African and Other Developing Countries**  
(births or deaths, per 1,000 population)

Country	Crude birth rate, 1983	Crude death rate, 1983	Growth rate, 1983 (percent)
<b>Sub-Saharan Africa</b>			
Cameroon	46	15	3.2
Côte d'Ivoire	46	14	4.2
Ethiopia	41	20	2.1 <sup>a</sup>
Ghana	49	10	3.9
Kenya	55	12	4.3
Mali	48	21	2.3
Nigeria	50	17	3.3
Senegal	46	19	2.8
Sudan	46	17	2.8
Tanzania	50	16	3.4
Uganda	50	19	3.3
Zaire	46	16	3.1
Zambia	50	16	3.4
Zimbabwe	53	13	4.0
<b>Other regions</b>			
Bangladesh	42	16	2.6
China	19	7	1.2
Colombia	28	7	1.9
India	34	13	2.2
Indonesia	34	13	2.1
Mexico	34	7	2.5
Peru	34	11	2.3
Philippines	31	7	2.3
Thailand	27	8	1.9

a. The unusually low rate for Ethiopia reflects the famine in 1983.

Source: World Bank (1985b), p. 212.

tancy of over 50 was rare. By the 1980s, however, few countries had life expectancies below 45. Some had climbed above 55, with corresponding infant mortality rates of less than 100. Although the average level of mortality in Africa is still the highest in the world, some countries have achieved life expectancies comparable to those of countries in other developing regions.

By contrast, fertility in Africa is extremely high by world standards (see Table 2). In most African countries total fertility rates are over 6, and in several they are over 7. Rates in eastern Africa are generally higher than in western Africa. Most rates below 6 reflect involuntary pathological sterility. Meanwhile, total fertility rates in China, Indonesia, and Thailand have fallen from a peak of 5–6 to 2–4 today. In other areas, such as Central America, the Middle East, North Africa, and Muslim parts of the Indian subcontinent, total fertility rates of up to 7 can be found. But the rates of 7–8

**Table 2. Infant Mortality Rates and Total Fertility Rates in Selected Sub-Saharan African and Other Developing Countries (1983 Estimates)**

Country	Infant mortality rate (deaths per 1,000 live births)	Total fertility rate
<b>Eastern and Southern Africa</b>		
Zimbabwe	69	7.0
Kenya	81	8.0
Congo	83	6.0
Tanzania	97	7.0
Zaire	106	6.3
Uganda	108	7.0
Mozambique	109	6.5
Sudan	117	6.6
Ethiopia	121	5.5
Malawi	164	7.6
<b>Western Africa</b>		
Ghana	66	7.0
Nigeria	113	6.9
Cameroon	116	6.5
Côte d'Ivoire	121	6.6
Senegal	140	6.6
Sierra Leone	198	6.5
<b>Other regions</b>		
China	38	2.3
Thailand	50	3.4
Colombia	53	3.5
India	93	4.8
Indonesia	101	4.3
Egypt	102	4.6
Bangladesh	132	6.0

Source: World Bank (1985b), pp. 212, 218.

in eastern and southern Africa and occasionally in western Africa are almost unparalleled elsewhere.

To summarize, other developing regions have achieved a demographic transition; both death rates and birth rates have declined from high levels. Africa has begun its demographic transition—death rates are declining—but it has yet to achieve the second stage, falling birth rates. With the exception of Zimbabwe, no documented case of national fertility decline has occurred in Africa.

#### *Settlement Patterns and Migration among Countries*

Africa's population densities vary but are generally low. National averages range from 1 to 200 persons a square kilometer and are under 40 in most countries. Even in the most heavily settled areas densities rarely rise above 200 a square kilometer.

By contrast, national densities in Asia range from 42 to 600, with some areas exceeding 1,000 people a square kilometer. Africa has two main zones of heavy settlement: the east-west coastal forest belt of West Africa, and the north-south line of the Great Rift System in East Africa. Three areas are largely uninhabited: the east-west Sahel belt, the rain forest basin of central Africa, and the desert and semidesert areas of the southwest. These settlement patterns reflect many factors: soil quality and climate, other natural resources, diseases, culture, and historical and current patterns of trade, commerce, and political power. About one-fifth of Africa's people live in countries with difficult terrain and with few resources or low rainfall, one-fourth live in oil-exporting countries, and the remainder are in countries with intermediate resource endowments.

In the past, migration among countries helped correct for resource scarcity and population growth in land-scarce countries. For example, Burkina Faso and Côte d'Ivoire both benefited from the presence of Burkinabè in the latter country. Now and for the future, intercountry migration is severely limited. Most recent cross-border migration has been temporary, and even when emigration is intended to be permanent, changed economic or political conditions have resulted in migrants' being abruptly expelled. The expulsion of foreigners from Nigeria in 1983 following a decline in world oil prices and the consequent recession in Nigeria is a case in point. Nor is there any opportunity for substantial permanent emigration from Africa to other continents. Between 1970 and 1980 emigration represented only 0.3 percent of the population growth of the African continent, compared with 0.5 percent for Asia and 2.5 percent for Latin America. Hence, Africa's natural increase will have to be absorbed within Africa, and increasingly within national boundaries.

#### *Urbanization*

In 1982, 22 percent of Sub-Saharan Africa's population lived in towns and cities. Although Africa is less urbanized than other regions, it is no less urbanized than other regions with the same per capita incomes and overall densities. There are, however, substantial variations. At one extreme, Burundi, Rwanda, and Uganda have less than 10 percent of their people in urban areas; at the other,

Congo, Mauritius, Zaire, and Zambia have between 38 and 54 percent. In twelve countries more than 50 percent of the urban population lives in the country's largest city. (Rural dwellers tend to be dispersed, particularly in eastern and southern Africa; even large villages are rare in some countries.)

Urbanization is proceeding rapidly: between 1970 and 1982 the urban population in Sub-Saharan Africa grew at over 6 percent a year, compared with 3.9 percent in India and 4.5 percent in Indonesia during the same period. By 2000, it is projected, Sub-Saharan Africa as a whole will still have a predominantly rural population (65.4 percent). By 2025, however, the region is projected to have 54 percent of its population living in urban areas. The United Nations projects that by 2000 sixty cities in Sub-Saharan Africa will have populations of over 500,000, compared with twenty-eight today. By that time Dakar and Nairobi are likely to have more than 5 million inhabitants each, compared with between 1 million and 2 million today.

### ***Age Structure***

African populations are young and are getting younger. Children less than 15 years of age now constitute 45 percent of the total population, compared with 37 percent in Asia and 40 percent in Latin America; children under 5 years make up nearly 20 percent of the total. These percentages are so large that, despite particularly small elderly populations, the dependency ratio (the ratio of the number of people under 15 and over 64 years to the number of people aged 15–64, the working age) is around 1.0, compared with 0.5–0.8 in most Asian and Latin American countries.

This age structure has two implications. First, an exceptionally large share of resources must go to meet the special needs of the young. Education, for example, now averages 16 percent of the public budget and 3 percent of the gross national product (GNP) in many Sub-Saharan countries (see Chapter 2). Second, population growth has a built-in momentum; even if the total fertility rate were to drop immediately to the replacement level of 2.2 births per woman, it would take about a hundred years before Africa's population stopped growing. It would then be 80 to 100 percent larger than it is today.

### ***Accounting for Rapid Population Growth***

The population of Sub-Saharan Africa is currently growing at 3 percent a year; within Sub-Saharan Africa, however, country growth rates range from 2.1 to 4 percent, largely as a result of variations in fertility and mortality. The reasons for these variations are the starting point for programs to slow population growth. These reasons are reviewed here, and their policy implications are discussed in Chapter 3.

### ***Explaining Mortality***

Before modern development, mortality varied sharply across Africa, largely because of natural or environmental factors such as climate, altitude, food availability, and disease. These influences are still the most powerful in Africa today, but mortality has also come to depend on developmental factors such as per capita income, agricultural progress, infrastructure, education (particularly of women), and public health programs. The past forty years have seen striking improvements in all of these areas. It is not surprising that mortality has declined.

Eventually, such improvements can override the effects of nature and the environment. This has happened in other developing regions where underlying conditions were as unhealthy as in Africa; indeed it seems to have occurred already in a few African countries, notably Congo and Ghana. After World War II both countries had rapid increases in income, education, and infrastructure, and mortality fell from the high West African level to one more typical of contemporary eastern and southern Africa. Such progress was later slowed considerably by Africa's economic difficulties. In at least four countries per capita income has declined for at least five years. And per capita production of food has declined for Sub-Saharan Africa as a whole, creating a need to increase imports. If these trends continue—especially if nutrition deteriorates and health services stop growing—reductions in mortality rates could slow sharply or even cease. At the moment, however, mortality is still declining in the continent as a whole as a result of past improvements in education, income, infrastructure, and health facilities.

## Explaining Fertility

The reasons for high fertility in Africa can be divided into two groups: the proximate determinants and certain underlying causes of attitude and behavior. The proximate determinants are natural fecundity, marriage patterns, decline in use of breastfeeding and abstinence, and limited use of modern contraception.

**NATURAL FECUNDITY.** Fecundity depends primarily on basic health and is impaired by diseases and infections. The other three factors account for the difference between natural fecundity and actual fertility (see Table 3).

**MARRIAGE PATTERNS.** The age at marriage in Africa ranges from 15 to 22 years for girls but is generally low, thereby contributing to high fertility. The marriage age has not risen much. In fact, in about half the countries surveyed in the World Fertility Surveys (WFS) and Contraceptive Prevalence Surveys (CPS), women still marry early. Whatever rise has occurred in age of marriage has been partly offset by increased premarital sexual activity. Thus, age at first birth is also low and has changed little. Marriage has always been and still

is nearly universal for women, and the vast majority continue in some kind of union throughout their childbearing years.

**BREASTFEEDING AND ABSTINENCE.** Historically, lengthy breastfeeding and sexual abstinence after a birth have been the main restraints on fertility in Africa. There is limited evidence that both practices are diminishing, at least among some groups of women. In addition, pathological infertility—a severe problem in some regions—appears to be lessening as health services spread (see Box 10 in Chapter 4).

**USE OF MODERN CONTRACEPTION.** Despite some increases in recent years, fewer than 5 percent of couples use modern contraception in most Sub-Saharan countries. Table 3 shows how little contraception contributes to lower fertility in Africa compared with Latin America and East Asia. Only in Botswana and Zimbabwe (where rates are 19 and 27 percent, respectively) has contraceptive prevalence risen enough to affect fertility. Contraceptives are not widely available, but recourse to illegal abortion is increasingly common in many countries.

Table 3. Total Fertility Rates and Reduction from Total Potential Fecundity Owing to Different Determinants of Fertility, Selected Countries

Country and year	Total fertility rate	Reduction from total potential fecundity because of			
		Marriage delay	Breast-feeding	Contraception	All other factors
<b>Sub-Saharan Africa</b>					
Ghana (1979–80)	6.22	2.16	4.31	0.86	3.45
Kenya (1977–78)	7.40	2.69	4.22	0.67	2.02
Lesotho (1977)	5.27	3.05	4.34	0.47	3.87
Senegal (1978)	6.90	1.72	4.65	0.20	3.54
Sudan, northern (1979)	5.93	2.88	3.87	0.44	3.99
<b>Latin America and Caribbean</b>					
Colombia (1976)	4.27	4.71	1.53	4.20	2.29
Mexico (1976–77)	6.27	3.43	1.82	3.43	2.04
<b>South Asia</b>					
Bangladesh (1975–76)	5.96	1.21	6.84	0.77	2.32
Pakistan (1975)	6.24	2.26	4.52	0.43	3.55
<b>East Asia and Pacific</b>					
Indonesia (1976)	4.51	2.62	5.25	2.50	2.12
Korea, Rep. of (1974)	4.23	4.72	3.32	2.55	2.17
Philippines (1978)	5.12	4.99	2.61	2.97	1.31
<b>Middle East and North Africa</b>					
Jordan (1976)	7.63	3.28	2.53	2.62	0.94

Source: World Bank (1984d), Table 6.1 (computed from World Fertility Surveys data).

Marriage patterns and use of contraception are themselves affected by underlying economic, social, and cultural forces, most of which, in Africa, lead to high fertility.

**AGRICULTURAL ECONOMY AND POLITY.** Most Africans make their living from the land, and child labor is valuable for tending food and cash crops, herding animals, and helping with the daily chores—fetching water and wood, preparing food, tending the homestead, and caring for children. Having several children can be a considerable help to the typical rural family. On balance, children can often contribute to family income—but the surplus over subsistence may be mainly of benefit to adults. Moreover, in traditional African agriculture, the status and wealth of a cultivator depends not on land (which in an area with tribal tenure he does not own), but on family size and thus on the amount of land he can cultivate. As systems of landholding change, education spreads, and urban work opportunities increase, parents want increasingly to educate their children. Then the costs and benefits of children change: children in school have less time to work at home, and the costs of educating children (uniforms, books, and so on) mount even when schooling is free. These changes are beginning—in some places, just beginning—to erode the traditional benefits of large families.

**PROTECTION AND SUPPORT.** In agricultural societies protection and support, especially during old age, come largely from the family. Women are often obliged by tradition or ancient law to rely on their fathers, their husbands, and then their sons. Obligations within extended families can be widespread. Within polygynous families—for example, in southern Sudan—children are expected to regard their father's other wives as more or less equal to their own mothers in many circumstances, and their duties to their siblings extend to half-siblings. Older children may also provide physical protection for the family, particularly in remote areas. On a wider scale, ethnic groups and nations may seek security not only in wealth but also in numbers. Although the demand for many children may eventually be weakened by the introduction of social security, the growth of legal systems, and other similar measures, many societies still equate large families with wealth and power.

**TRADITIONAL ROLE OF WOMEN.** The role of women varies considerably among African countries, but in many places women do most of the farming, gather the fuelwood, and draw the water. And everywhere, they tend the homestead and safeguard family health as best they can. Often they do all this notwithstanding the cumulative physical strain of repeated pregnancy. Women want children for economic reasons—to help them now and to provide protection and support as they age. They also want children for social reasons—because their own standing in their family and community is so closely tied to their childbearing.

**CULTURAL VALUES.** Perhaps as a reflection of these age-old facts of life, traditional cultures place a premium on high fertility. Some link children to immortality of parents or other family members, and many accord great respect to mothers with many children. Barren women are often liable to divorce at their husband's will and may be abandoned by their own families.

**LIMITED PROSPECTS.** Parents who see little hope that their children will enjoy fuller lives than they have done have little incentive to limit family size so as to spend more time and resources on bringing up each child. Investing in any one child is risky when child mortality rates are high. Prospects of better-paying jobs that require education are limited, and in any case schools are often far away and costly. These considerations can change, however. If education will lead to a better job, perhaps in the city, or to more productive farming, parents may want each child to go to school. As more children survive into adulthood, parents become more willing to limit births.

### *Is Africa Different?*

The strength of traditional pronatalist attitudes in much of Sub-Saharan Africa raises the question of whether they are unique to Africa or parts of Africa. The answer is, probably not.

First, incomes are generally lower than in other countries, levels of education and health levels are poorer, and urbanization is less extensive; these factors help explain Africa's persistent high fertility. Second, much of the progress that has occurred in Africa—reduction in child mortality and improvements in life expectancy, increases in school

enrollment and in urbanization, and improvements in the status of women—is so recent that old attitudes have had little time to change. Parents may not fully recognize the improvements in health, for example, or they may not be convinced that they will last. Third, although traditional beliefs—for example, that having children allows ancestors to be “reborn”—reinforce pronatalist attitudes in much of Africa, such beliefs are not unique to Africa. Some religious leaders express reservations about family planning, but others, both inside and outside Africa, are supportive. The teachings of the Catholic Church on marriage and sex have an influence in some African countries, but so do they elsewhere. It is likely that in Africa, as in other parts of the world, these views will change as development proceeds (see Box 2).

### Population Projections

The consequences of Africa's rapid population growth cannot be fully assessed without projecting demographic trends. Such projections are inexact, partly because demographic data, although improving, are still limited. More fundamentally, projections must be based on assumptions about how the social, economic, and cultural determi-

nants of fertility, mortality, and migration are likely to change over time. As such they depend heavily on judgment and should be regarded not as predictions but as illustrations of what would happen if all the assumptions made were correct.

### **Standard Projection**

The standard projection (World Bank 1985b) assumes considerable but achievable reductions in fertility and mortality. Such reductions in turn assume modest social and economic progress and increased efforts to reduce fertility through family planning programs.

The standard projection for Sub-Saharan Africa as a whole is built up country by country. For each country, mortality is projected to continue declining at rates that vary, depending on the current mortality level and on female primary school enrollment. International migration is projected to decrease slowly from current levels to zero by 2000 and then to remain negligible. For fertility, the pace of decline depends on each country's social and economic circumstances that affect demand for children and the country's administrative capacity to supply family planning information and services. Indicators of demand include educa-

### **Box 2. Changing Attitudes Toward Family Planning: Swaziland**

Traditional attitudes about children and family planning are beginning to change in many Sub-Saharan African countries. Surveys in Swaziland in 1976, 1979, and 1980 illustrate such change. In Swaziland the basic unit of the social system is the family. Families traditionally live on scattered homesteads as part of kinship groups and clans; men are traditionally the dominant sex; early marriage is customary; and large family size is valued.

In 1976 a small survey of the attitudes of people living in three different parts of the country found that parents wanted an average of 7.3 children in the rural area, 6.8 in the semirural area, and 4.9 in the urban area. Only the figure for the urban area was lower than the national average total fertility rate. On average, men desired one more child than women, and women expressed more positive attitudes toward spacing births.

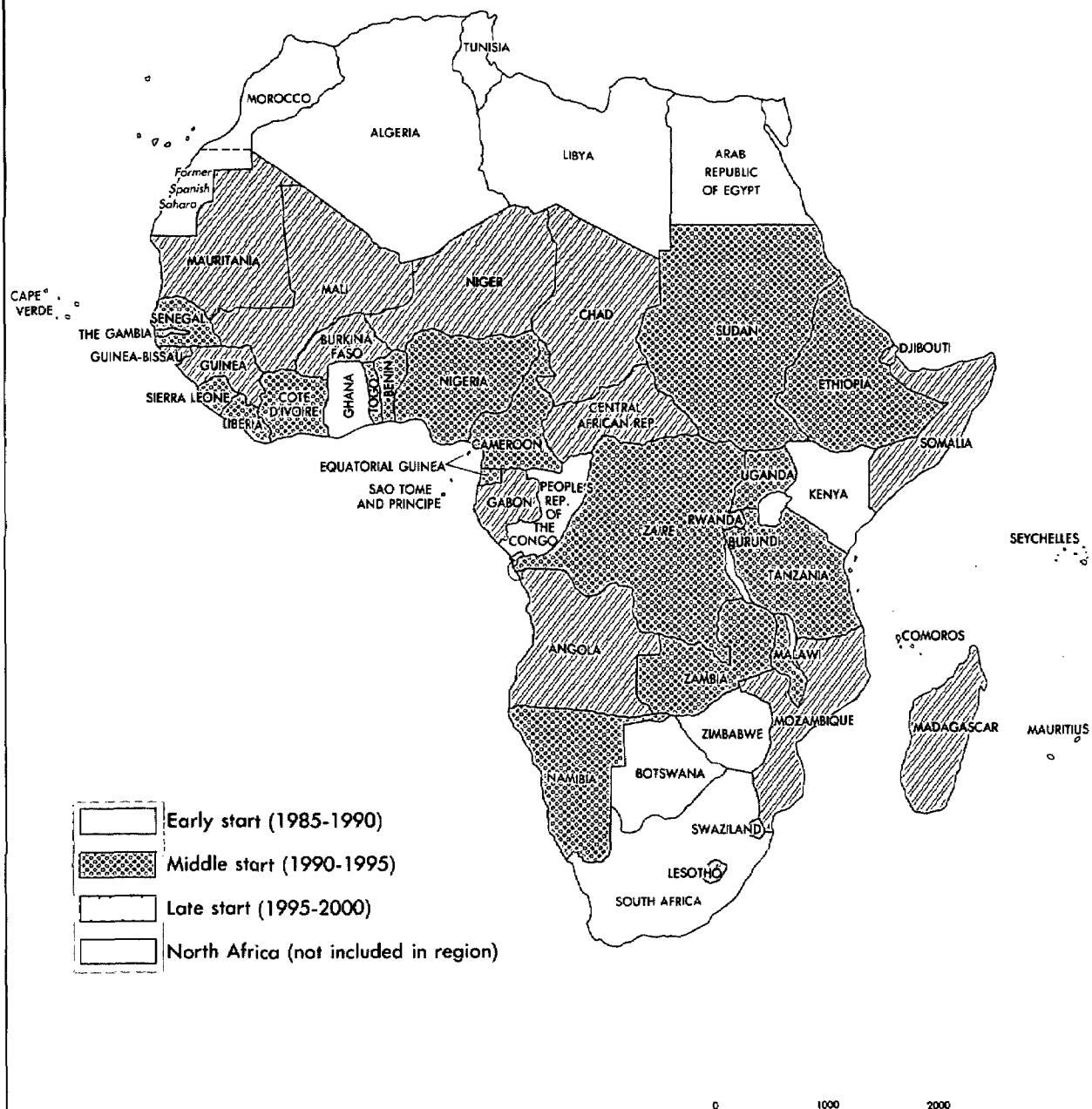
Three years later the results of a second, larger survey suggested some weakening of traditional at-

titudes. For example, 70 percent of the respondents felt that children were an economic burden. This survey also showed that opposition from husbands was a major problem for many women who wanted to make use of family planning services and that some women were using contraceptives secretly.

A third survey, in 1980, was limited to the capital, Mbabane. The sample size was only 186, and nearly two-thirds of the respondents were between the ages of 15 and 25. Eighty percent of the respondents had a favorable view toward family planning, and about 60 percent were themselves practicing contraception. About one-fifth of the respondents, however, had no knowledge of a specific modern contraceptive—a high figure for young residents of an urban area.

Although attitudes are changing, the country's family planning program still faces major constraints, particularly opposition from husbands and traditional and religious leaders.

**Map 1.**  
**PROJECTED DATE OF INITIATION OF FERTILITY DECLINE,  
 SUB-SAHARAN AFRICA**

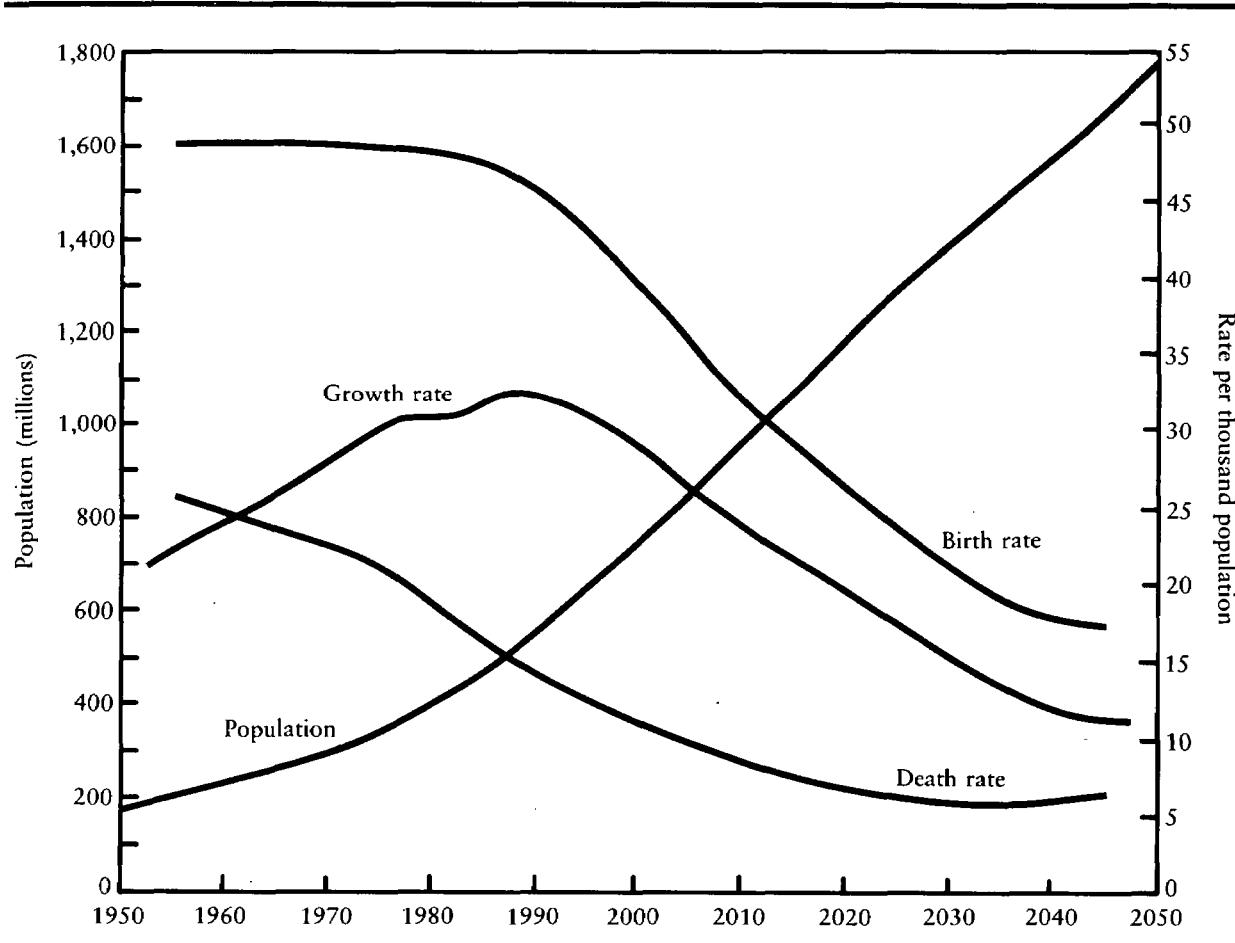


tion, urbanization, infant mortality, and per capita income. Indicators of supply include educational levels, the number of health workers and facilities per thousand population, and an index of the strength of current family planning programs (see Chapter 4). Where the demand for family planning services is likely to grow more readily and where the capacity to supply information and services is substantial, fertility is assumed to begin (or continue) declining within five years. Countries in the second category are projected to start fertility declines in five to ten years and countries in the third category in ten to fifteen years. Once begun, fertility is assumed to follow a common pattern and decline within fifty years to replacement levels (at which parents just replace themselves) of about two children (see Map 1). Early starters include Botswana, Congo, Ghana, Kenya, Swaziland, and Zimbabwe. At the other extreme, countries that

are likely to start reducing fertility only between 1995 and 2000 include most of the Sahelian countries, plus a few countries that are experiencing civil disturbances or especially severe developmental problems and countries where pathological sterility has suppressed fertility rates. Twenty-two countries, including Nigeria, Sudan, and Zaire, are projected to initiate fertility declines between 1990 and 1995.

Figure 3 shows the consequences of these assumptions for future birth, death, and population growth rates for Sub-Saharan Africa as a whole. Although birth rates are projected to start falling, continued declines in death rates mean that the population growth rate will go on increasing and will peak around 1990. Thereafter, the growth rate will decline to 2.8 percent a year in 2000, 2 percent a year in 2020, and 1.1 percent a year in 2045.

**Figure 3. Population Size and Birth, Death, and Growth Rates, Sub-Saharan Africa, 1950–2045, Standard Projection**



Source: Data base for *World Development Report 1985*.

If these trends materialize, the population of Sub-Saharan Africa would increase by 59 percent between 1985 and 2000 and more than double by 2010; that is it would rise from about 460 million in 1985 to 730 million in 2000 and almost 950 million in 2010. By 2045, sixty years from now, the population of Sub-Saharan Africa would be 1.7 billion—3.7 times its current size. It would have grown from half the size of Europe's population in 1950 to more than twice that size in 2045. Kenya's population would increase by 77 percent over the next fifteen years and by three and a half times over the next sixty years. Even countries with relatively low current growth would experience great increases: the populations of Gabon (where fertility is low) and of Sierra Leone (where mortality is high) would be nearly 50 percent larger in 2000 and three times larger by 2025.

### ***Alternative Scenarios***

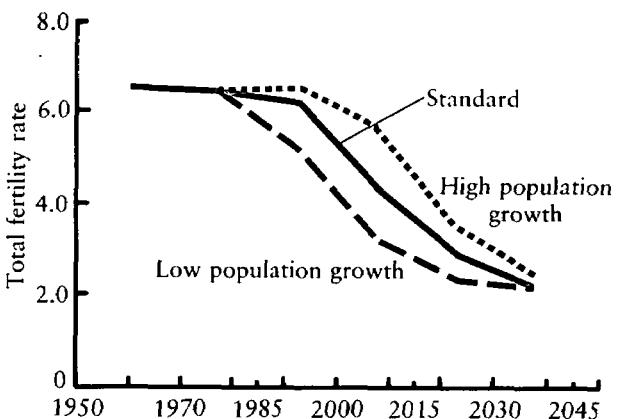
The standard projection represents only one of many plausible pictures of the future. One alternative is that mortality will not fall as rapidly as is assumed in the standard projection. If mortality held steady, the short-term impact would be minimal: the population in fifteen years would be only 2 percent smaller than in the standard projection and in thirty years it would be 9 percent smaller.

Plausible variations in fertility rates would have much larger effects, as Figure 4 shows. The high case for population growth assumes that demand for and supply of family planning services expand less rapidly than in the standard projection. Fertility would decline somewhat more slowly than in the standard case and would reach replacement level ten years after the date in the standard projection. The low case assumes that fertility starts to fall at the same time as in the standard case or five years earlier but that the decrease is faster, so that replacement is achieved fifteen years earlier. This speed of decline has occurred in a few places outside Africa that made rapid socioeconomic progress and instituted strong family planning programs (Republic of Korea, Singapore, and Taiwan).

The results of these alternative scenarios are summarized in Figure 5. They suggest three major conclusions.

- *Substantial population growth in Africa is inevitable.* Even with the faster decline in fertility

**Figure 4. Alternative Projections  
of Total Fertility Rates, Sub-Saharan Africa,  
1950–2045**



Source: Data base for *World Development Report 1985*.

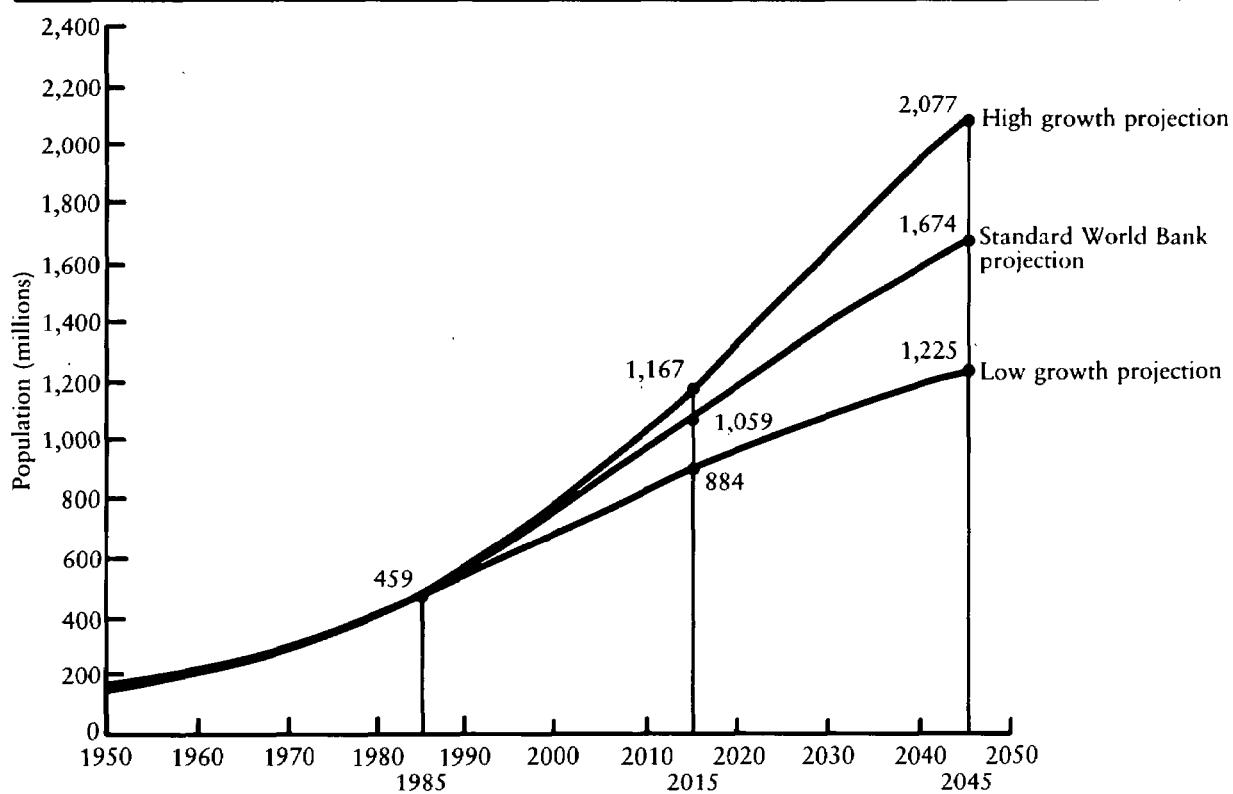
(and provided that mortality does not actually rise), the population will be at least 45 percent larger in 2000 than it is today. By 2045 it will have increased by at least half a billion people, to two and a half times its present size.

This population growth during the remaining years of the century will pose a formidable challenge to the governments and peoples of Sub-Saharan Africa. Along with policies and programs to reduce fertility, other policies must also be designed and implemented to absorb and manage the short-term growth in population.

- *The rate of population growth is likely to remain above 3 percent* during much of the remainder of this century. Only near the turn of the century would it start declining. In 2020 it would still be 2 percent a year and by 2050 less than 1 percent a year. The relatively lower rate of growth and declining trend in the rate in the next century would somewhat ease the economic burden of rapid population growth described in Chapter 2.

- *Rapid fertility decline can make a significant difference after 2000.* Over the next fifteen years, under the standard assumption on fertility, Africa's population would increase by 3 percent less (some 22 million people) than in the high-growth case. By 2045 the difference would amount to 403 million, or 19 percent. By 2045, in the low-growth case, the population would be 41 percent less than in the high-growth case.

**Figure 5. Results of Alternative Population Projections, Sub-Saharan Africa, 1950–2045**



Source: Data base for *World Development Report 1985*.

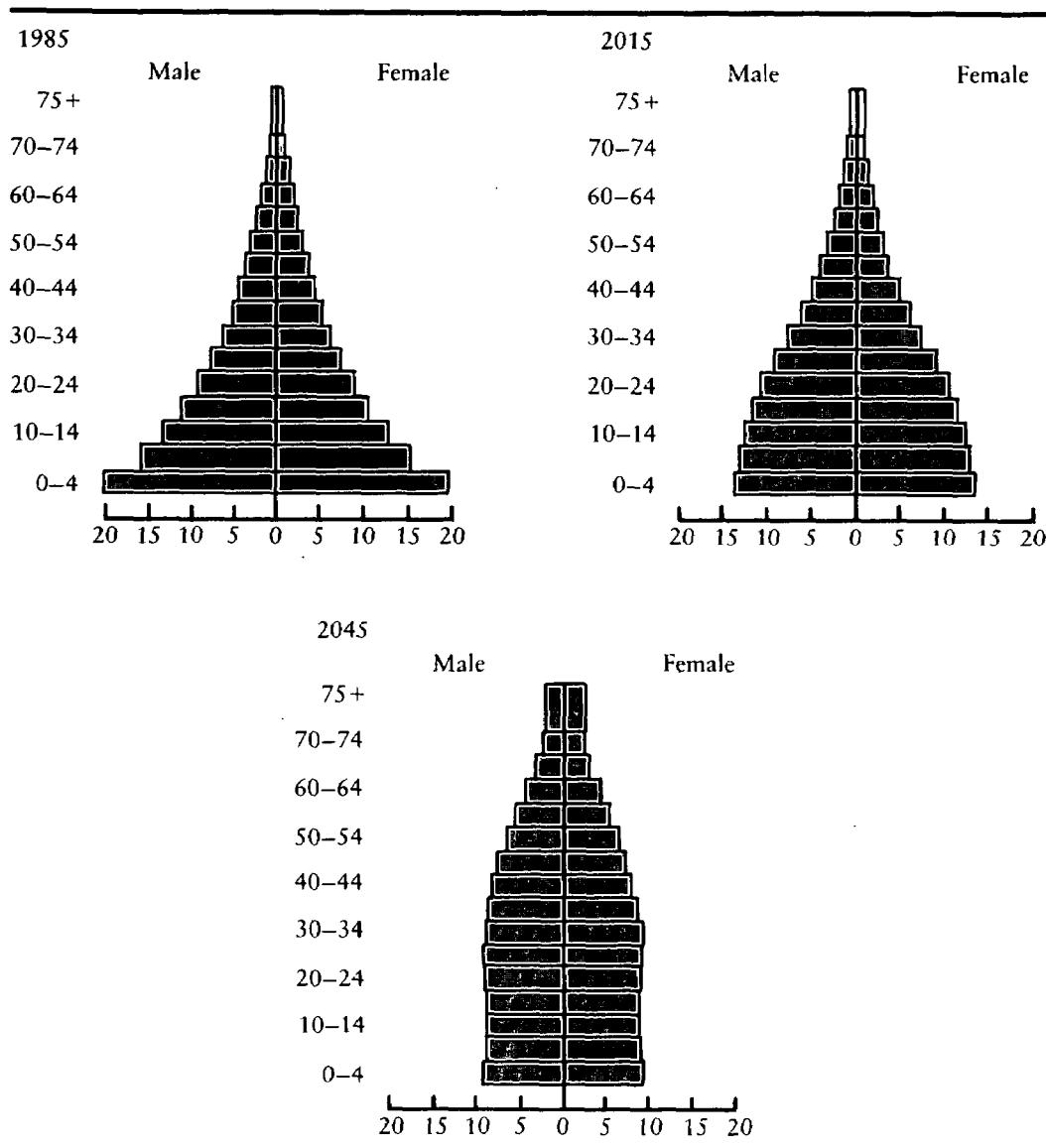
These projections also suggest that by 2050 most of Sub-Saharan Africa's population growth would be over. Both mortality and fertility would have fallen to near-minimum levels. The crude birth rate would have declined from 47 to under 16 and the crude death rate from 16 to 6. Average life expectancy in the continent would have risen from 50 to 70 years, and the average total fertility rate would have fallen from 6.5 to under 3. The age structure would have shifted from the broadly based pyramid of a youthful population with heavy dependency burdens to the narrower urn shape of a population that is passing through the demographic transition and achieving lower dependency burdens (see Figure 6). The proportion of the young in the dependent population would have declined and that of the elderly would have

increased. The demographic transition would be more or less complete.

Under these population projections, Sub-Saharan Africa would not face the problem of severe old-age dependency that is projected for the United States and China. In 2050, it is projected, the United States and China will have 21 percent and 20 percent, respectively, of their populations aged 65 and over, compared with only 9 percent for Sub-Saharan Africa under the standard projection. Africa, in fact, would not have a comparable proportion of its population over age 65 until the end of the next century.

These are, it must be emphasized, only projections. But they give some idea of the challenge facing Africa and the rewards and penalties of the decisions that can be made today.

**Figure 6. Projected Age Structure of the Population of Sub-Saharan Africa, 1985, 2015 and 2045, Standard Projection**



Source: Data base for *World Development Report 1985*.



## *Consequences of Rapid Population Growth*

Most poor parents in Africa believe it pays to have many children—emotionally, if not financially. But one family's gain is often another's loss. Parents may try to increase their incomes by sending more children out to work in the hope that some will do well. But if that simply increases unemployment or depresses wages, only a few can succeed: everyone's odds are made worse, except for those who own land or capital and benefit from lower wages.

The reason parents seem to gain from many children is that they can hope for certain benefits from children but do not themselves pay all the costs of childraising. Extended families may help out considerably; social obligations to relatives are strong and child fostering is common, especially in West Africa. Government provides free or highly subsidized schooling and health care. And parents recognize that the costs associated with increased competition for jobs and for such scarce resources as land and water are distributed among many people. Similarly, a good part of the costs of bearing and rearing children may fall on women—yet in many African countries the decision to have another child is made largely by a man.

Beyond this, some of the costs that parents bear directly may not be apparent to them. They may not fully realize the damage high fertility can cause to the health of mothers and children. They may

not make the connection between frequent pregnancies and a greater likelihood of death or illness among young children and their mothers. They may not anticipate that in a changing economy they will have difficulty financing the costs of advanced schooling for large families.

Theoretically, if all parents could agree to have fewer children so that each child could have more education and care, all would be better off. But such social contracts are hard to achieve. Instead, each family (or clan) tries to maximize its own benefits. Having many children seems the best hope—however slim—for more security, power, and income. Such hopes are kept alive by examples of large families that do succeed, and each family tries to beat the odds.

This chapter assesses the consequences of individual decisions to have many children. At the family level, high fertility has consequences for maternal and child health. At the societal level, rapid population growth affects agriculture, natural resources, employment and wages, and provision of health and educational services.

### **Effects of High Fertility on Maternal and Child Health**

An African mother's chances of illness or death during pregnancy and childbirth are high, but they

are lower if she has had fewer than five births and is aged between 20 and 35. A child's chances of being born healthy and of surviving the first few years of life are lower in Africa than elsewhere, but they are significantly increased if children in the family are born at least two years apart and if the mother is between 20 and 35 years old.

Africa has high maternal mortality. Perhaps the most accurate figures come from the Danfa rural health project in Ghana where, for each 100,000 births, 400 mothers die. In Swaziland the estimate is about 370. Elsewhere in Africa the rate is generally between 200 and 600, as against 190 for parts of Egypt, 80 in Sri Lanka, and fewer than 10 in Sweden and Denmark.

Africa's high average is associated with poor health generally and with the shortage of medical facilities. In parts of Africa, female circumcision and repeated infibulation after childbirth probably raise the mother's risk of morbidity and mortality, but the mother's age and the number of children she has had are also important. In Nigeria the risk of dying from childbirth is about 2.5 times greater for a woman aged 16 or under or for a woman over 30 years than for a woman in her early 20s. In Thailand, by contrast, the risk of maternal mortality is only 1.3 times greater for women in these high-risk age groups. In Senegal the risk of dying from childbirth is about three times greater for a woman with eight or nine children than for a woman with two children; in Matlab Thana, Bangladesh, the risk is about two times greater. The higher risk as number of births increases is partly a function of age; women with many previous pregnancies tend to be over 30 years old. But non-African studies that have allowed for the age factor show that the number of previous births has a strong effect of its own. For example, in Matlab Thana, Bangladesh, maternal mortality is about 250 per 100,000 live births for the second and third births for women aged 30–39 but about 740 per 100,000 for the sixth or higher birth for women in the same age group. (For a woman having her first child, the risk of death is also high—about three times greater—partly because first-time mothers are, on average, very young in Africa.) The figures on maternal mortality do not reflect the health costs to women—and to the families in their care—if the women live but suffer the often debilitating health problems associated with frequent pregnancy.

Better spacing and timing of births and reduction in the number of births would reduce infant and child mortality. In Africa and elsewhere, infant mortality is strongly affected by spacing of births (see Table 4). In Cameroon a baby born within two years of its mother's previous delivery has a 90 percent greater chance of dying during its first year of life than a child born more than two years after the previous birth. The risk to the earlier-born child is nearly twice as great when the younger child is born within two years.

In nearly all the countries studied, infant mortality is lower for the second and third children and higher for first births and for births beyond the third. In Benin a seventh or later child has about a 30 percent greater chance of dying in its first year than a fourth to sixth child and about a 60 percent greater chance than a second or third child (see Table 5).

The mother's age also has a powerful effect on infant mortality. In Kenya babies born to teenage mothers have a 50 percent greater chance of dying than those whose mothers are aged 20–29. In Senegal the difference is about 40 percent. Infant mortality increases again for mothers over 35, for their babies run an increased risk of congenital defects. Yet in Ghana 15 percent of all births are to women in their teens, 11 percent to those aged 35–39, and 9 percent to those 40 or older. Figures for Kenya, Lesotho, and Nigeria are similar: about a third of all births are to women in the high-risk age groups. African countries differ from each other in spacing patterns. Whereas in Kenya and Sudan about one-

**Table 4. Relative Risk of Death among Infants, by Preceding Birth Interval, Selected Countries in Sub-Saharan Africa**

Country	Survey date	Length of birth interval (months)		
		<24	24–47	>47
Benin	1981–82	1.5	1.0	0.7
Cameroon	1978	1.9	1.0	0.9
Côte d'Ivoire	1980–81	1.4	1.0	0.6
Ghana	1979–80	2.1	1.0	0.8
Kenya	1977–78	0.7	1.0	0.9
Lesotho	1977	1.8	1.0	0.8
Mauritania	1981	1.8	1.0	0.9
Senegal	1978	1.3	1.0	0.8
Sudan	1979	1.6	1.0	0.6

*Note:* The baseline group is infants born at the end of the 24–47 month interval.

*Source:* Maine and others (1985).

**Table 5. Infant Mortality Rates in Selected African Countries, by Birth Order and Maternal Age**

Item	Benin	Cameroon	Ghana	Kenya	Senegal
<b>Birth order</b>					
1	107	122	78	103	125
2-3	104	93	62	96	108
4-6	126	94	76	83	116
7+	162	125	90	106	120
<b>Mother's age</b>					
Under 20	133	116	88	104	140
20-29	114	96	66	70	108
30-39	126	103	71	75	114

Source: Maine and others (1985).

third of babies are born less than two years after the mother's previous birth, in Ghana, Lesotho, and Senegal the figure is less than one-fifth—comparable to that for Korea.

The data on maternal and infant mortality provide some guide to how many lives could be saved by spacing, timing, and limiting births. The proportion of women who say they want no more children is smaller in Africa than elsewhere, and only a fraction of that group uses efficient contraceptive methods. If all African women who want no more children were actually to have no more, roughly one-sixth of maternal deaths could be avoided. If no woman had a child after the age of 40, another one-fourth to one-third of maternal deaths could be avoided. To look at it another way, if completed family size fell from eight to six, maternal deaths could be reduced by 25-30 percent.

The results are equally dramatic for infant and child mortality. If all birth intervals of less than two years were increased to two or more years, the number of infant deaths could be reduced by about 12 percent in Lesotho and by up to 20 percent in Cameroon, Ghana, and Kenya. For all of Sub-Saharan Africa, 12-20 percent of infant deaths might be avoided. These reductions may be somewhat exaggerated since mothers with longer birth intervals also tend to be better off, more educated, and closer to health care, and these advantages rather than spacing itself may help explain their children's lower mortality. But recent research does take into account education and urban location, and the lives saved by spacing are still considerable. Indeed, it is possible that the gains are understated. The data indicate that the damage done

by short birth intervals is not fully captured by higher infant mortality but lasts beyond infancy, for the first five years of a child's life. In addition, longer birth intervals often result in lower fertility, which in turn reduces the number of high-risk births.

### Effects of Rapid Population Growth on the Economy.

Rapid population growth does not necessarily prevent per capita income from rising. In some circumstances, population growth may even contribute to development. But in most cases population growth, and especially rapid population growth, makes it more difficult to raise per capita income.

The conventional economic argument that rapid population growth slows per capita economic growth is based on a straightforward observation: if resources are fixed and the labor force grows, the additional people will have fewer complementary resources to work with and so will produce less per person—returns to labor will diminish. But on the face of it, this argument does not seem relevant to Africa, where apparently vast amounts of land are still untapped and could support larger populations without encountering diminishing returns. Nor has the argument of diminishing returns and growing scarcity of fixed resources seemed decisive elsewhere. Since the beginning of the period of modern economic growth in eighteenth-century Europe, population growth has in fact been accompanied by ever higher labor productivity and thus by economic growth, even where land seemed relatively scarce. In practice, for most countries in the past two centuries some expansion of the land frontier has been possible, and, more important, other factors have changed enough to prevent diminishing returns.

First, technology has improved. The industrial revolution of the nineteenth and twentieth centuries; the development of "miracle seeds" in the past twenty years; the use of improved fertilizers, irrigation systems, and other agricultural technology; and now biotechnology, computers, and modern electronics in general—all permit more efficient use of existing resources. Technological change offers potential for future improvements. The challenge of population growth may even inspire such discoveries. And a growing labor force may ease adjustment to the structural changes that

are necessary when the economy grows or the external environment changes.

Second, supplies of natural resources have not been fixed. Although some scarcities are growing in some areas, new supplies have also been found. More importantly, man-made resources, in the form of capital goods amassed through past investments, have complemented and enhanced natural resources, making them go further and raising the productivity of labor. It is now possible to recover or reuse natural resources that were previously inaccessible, to grow crops on land that was once thought barren, to renew forests, and to conserve water more effectively.

Third, investment in human capital—through better health, nutrition, education, and training—has proved crucial in increasing the productivity of labor. There is strong evidence that a better-educated labor force contributes significantly to growth of per capita incomes. Health care has also been a valuable investment in human capital. Better health reduces the risk not only of death but also of the debilitating diseases that can impair both physical productivity and learning.

Fourth, for some countries economies of scale in production and consumption have accrued from population growth. Denser populations have reduced the costs and increased the per capita benefits of investment in transport, communications, and markets and, in rural areas, in irrigation, agricultural extension services, and provision of social services, especially health and education. Many African countries could also benefit from economies of scale, especially in rural areas. But international trade allows even countries with small populations to benefit from economies of scale by exporting goods and services in which they have a comparative advantage and buying goods and services that can be obtained more cheaply elsewhere.

In short, average real incomes can increase despite population growth. As long as the growth of complementary resources outstrips the growth of the labor force, labor will be relatively scarce, and this will push up wages and living standards. Nineteenth-century America boomed when Europeans, many driven by population pressures in their own countries, emigrated to the American West. Populous countries in Europe and Asia have prospered with few natural resources by building up educated labor forces and industrial and service-oriented technologies. In the past thirty years, several

small economies with limited natural resources—Hong Kong, Korea, and Singapore, for example—have industrialized and modernized and have achieved the scale of economies of a large population through urbanization and trade. The poorer countries—India, for example—have achieved impressive agricultural growth through the Green Revolution based on “miracle seeds” and the irrigation and fertilizer they require, although slower population growth might have permitted more improvement in living standards.

Why, then, is population growth a problem in Africa? First, as is discussed in more detail below, unused land in Africa can provide income for more people only if new labor inputs are complemented by new investments in roads, seeds, disease eradication, irrigation, and so forth. In the absence of these complementary investments, much land is not economically useful; that is, it would not provide adequate support to those who might farm it. (Indeed, this is often the reason it is not already farmed.) Similarly, although land now in use could support more people, it could do so at the same or higher incomes only if substantial investment in nonlabor inputs accompanied additional labor.

A second reason is the extraordinarily high rate of population growth. Between 1970 and 1982 Africa's population grew at 2.8 percent a year. The growth rate between now and 2000 is expected to be 3 percent. During the nineteenth and early twentieth centuries, when European nations were industrializing and modernizing, Europe's rate of population growth seldom exceeded 1 percent a year. In addition, over 50 million people left Europe to find land and opportunity in the United States, Canada, Australia, and New Zealand. At its peak (1881–1910) emigration was equivalent to about one-fifth of the increase in Europe's population. In other parts of the developing world, although population growth has been rapid, it has not been so rapid as in Africa. Even in the 1960s, when population growth peaked in Asia and Latin America, population growth rates remained below 3 percent. In effect, Africa's population is growing so fast that even a very rapid rate of growth of complementary resources—a rate comparable to that achieved by developed countries during the past fifty years—would not be enough to sustain a rise in per capita incomes.

Third, initial conditions have made adjustment to rapid population growth especially difficult.

The conditions that faced African nations as they became independent—poverty and its associated low levels of education and health, weak infrastructure, and a weak human resource base for agricultural research, extension, and entrepreneurship—have made rapid accumulation of complementary resources and efficient use of available resources difficult. This initial difficulty has been compounded by poor policies: overvalued foreign exchange rates that have discouraged exports, protection of inefficient domestic industries, high taxes on food crops and export crops, and an urban bias in development strategies and investment. Rapid population growth, in combination with a poor initial position and subsequent policy failings, has meant an absolute decline in per capita income in the past decade in parts of Africa. Population growth has not been the only culprit, but it has interacted with other difficulties to short-circuit economic growth.

The remainder of this chapter deals with the effects of continuing high population growth in Africa on the prospects for raising per capita agricultural production, safeguarding renewable resources and the natural environment, raising the productivity of employment, (and thus average wages and income), and developing human resources through extension and improvement of health services and schooling.

### **Agricultural Production**

For many countries in Africa, agriculture accounts for a large share of GDP and exports and employs more than 70 percent of the work force. Hence, although increases in production in other sectors have contributed and can continue to contribute to economic growth, it is success or failure in agriculture that will determine success or failure for African economies as a whole.

At first glance, Africa is a continent of vast under-used territories that are rich in agricultural potential. It contains 20 percent of the world's cultivable land (defined to include arable land, land under permanent cultivation, pastureland, and forests and woodland) but 9 percent of its people. Sub-Saharan Africa has fewer than 60 people per 100 hectares of cultivable land, compared with an average ratio of 180 for all developing countries. Even in 2045, population densities in Africa will be relatively low. But foodgrain production grew

by only 1.5 percent a year in the 1970s, and per capita production of foodgrains actually fell during 1970–82 (see Table 6). Forestland has been shrinking by between 0.5 and 1.4 percent a year recently. In some areas, particularly the Sahel, soil degradation appears to be accelerating.

Policies that have penalized agriculture partly explain its poor performance. But there are underlying problems that reform of economic policies alone cannot address. Each contributes to the likelihood that rapid population growth cannot be accommodated in the agricultural sector without lowering average earnings.

- The distribution of good land in Africa does not coincide with the distribution of population. This disparity has not corrected itself over time through migration or trade. It has been maintained by political borders, tribal and linguistic differences, poor internal transport, endemic diseases, and so on, particularly in the high-potential humid and semihumid zones of central and western Africa.

- Traditional methods of farming that require fallow-field rotation still predominate; land must remain unused for long periods to allow its fertility to recover. Expanding the area of land under cultivation at any one time would mean shortening the fallow period; the consequent decline in yields can be avoided only through improved cultivation methods that require extensive extension efforts, use of more fertilizer, or use of better tools in land preparation.

- Africa still lacks the technological and managerial foundation for an agricultural revolution. Research on dryland crops and optimal crop rota-

**Table 6. Production and Imports of Cereals in Sub-Saharan Africa, Average Annual Volume (thousands of metric tons, except where otherwise specified)**

Item	1969–71	1980–82
Production	35,576	41,840
Imports	2,346	8,709
Total	37,922	50,549
Imports as percentage of total production	7	21
Population (thousands)	220,671	367,000
Per capita production	0.16	0.11
Per capita imports	0.01	0.02
Total	0.17	0.13

Sources: Cereal production and imports, World Bank (1984c), Tables 22 and 23; population, United Nations, (1980), pp. 13, 16.

tions has been limited, although it is now growing. Additional inputs—fertilizers, pesticides, draft animals, and irrigation—are being introduced only slowly and are not always economically sound investments for individual farmers in the absence of good roads, open markets, and reasonable prices. Low incomes, shortages of technical and managerial skills, and the time it will take to develop, adapt, and institute new technologies all mean that in some countries agricultural change is not coming fast enough to outstrip rapid population growth.

The extent to which rapid population growth exerts pressure on agricultural potential is determined both by the way land is used—that is, whether farming practices are appropriate and preserve inherent land potential—and by inherent land potential itself. Land potential varies substantially among regions of Sub-Saharan Africa.

Africa can be divided into three main population-vegetation zones: desert and subdesert; savannas, some of which are heavily and some sparsely populated; and forests and tree-crop areas with varying topographies and population densities. Some of these lands have only limited potential for employing more people at reasonable incomes. In desert and semidesert areas rainfall and vegetation are scanty or virtually nonexistent. Massive irrigation can help in some areas, but the cost would be high. Forest areas with heavy rainfall and dense tree cover will also remain sparsely populated until land is cleared and widespread disease is eradicated.

Most Africans therefore live in the savannas—areas of moderate rainfall and grassy or wooded vegetation. Population densities differ widely, depending on historical circumstances and local farming conditions. Densities are generally low to moderate in areas of forest fallow (fallow periods of more than fifteen years) and bush fallow (five to fifteen years). They are higher in places where technology and commercial agriculture have allowed fallow periods to be shortened without damage to the land and where, in areas such as the Burkinabè Mossi Plateau, population pressure has forced a reduction in fallow periods that has harmed the land. As the productive capacity of the land is diminished, farmers again shorten fallow periods to raise enough food, in a self-reinforcing cycle.

Population pressure has already contributed to ecological damage in parts of Africa and is making

some populations increasingly vulnerable to the vagaries of climate. The damage appears to be worst in certain semidesert and dry bushland areas—for example, in much of the Sahel, where population growth, despite some emigration, is high. Damage has also been severe in parts of Ethiopia, Kenya, and Uganda; these are savannas and forestlands where population densities are high and soil conservation, technological improvements, and emigration have not kept up with rapid population growth. Population pressure has forced farmers to expand deeper into forest areas or to shorten fallow periods without adopting appropriate techniques. Damage is less obvious but also great in higher-potential zones (the Sudanian and Sudano-Guinean areas). In parts of Sudan and Tanzania, by contrast, there is great potential for agricultural expansion, and population pressure is not a factor in explaining low agricultural productivity.

Many things can be done to increase the growth of agriculture: improvement of price policies; extension of credit, new inputs, and technical advice to improve cultivation practices; provision of infrastructure; land reform; and improvement of institutions. With improved policies and sufficient investments over the next several decades, Africa as a whole could feed itself and could profit from food and nonfood agricultural exports as well (see Box 3). For some countries, increases in agricultural production should assure food self-sufficiency sooner (although food self-sufficiency need not be a goal in itself). But in the short run, for many countries, agricultural output is unlikely to expand faster than the current population growth rate of just over 3 percent a year. Only a few countries—Mexico, the Philippines, and Thailand, for example—have ever achieved agricultural growth of more than 3.5 percent a year for more than two decades, and they did so under far more favorable conditions than currently exist in Africa.

### ***Renewable Resources***

Nonrenewable or exhaustible resources—oil and minerals, for example—are finite and thus scarce in the long run. Greater use in one period obviously implies less use in all subsequent periods. Perhaps because such resources are scarce, property rights to them are usually well established, and market prices tend to govern their use. As a

resource is depleted, extraction costs rise and push up the market price. Historically, a rise in the market price for an exhaustible resource has generated a search for substitutes; thus, oil replaced coal, and solar power may eventually replace oil. Regardless of the rate at which an exhaustible resource is used, it cannot remain productive in perpetuity. Indeed, greater use in one period may be economically sensible when the immediate needs of a growing population and the likelihood of eventually finding technological substitutes are considered.

In contrast, greater use in the present of renewable natural resources—land, forests, fisheries, and so on—does not affect use in the future unless it exceeds the rate of (natural or managed) regeneration. In that case, the renewable resource is “mined,” and the results are similar to those for nonrenewable resources. If this mining goes too far, the process becomes irreversible and both the stock and the future replenishment of the resource are gone forever. Temporary use of the stock beyond its capacity for renewal may be economically sensible if current needs are pressing in relation to future benefits forgone (or in relation to the higher costs of managed regeneration). But the immediate benefits of any irreversible overuse of the stock must be very large to outweigh the loss of the stream of resources that otherwise would flow in perpetuity. The risk of overuse and permanent degradation is greater with a large and rapidly rising population, and the problem is compounded if such resources are held in common. Where property rights are well defined and the market for land is functioning well, private landowners or public managers are likely to resist degradation of their property to protect its long-run value. But where resources are held in common and traditional rules have broken down (as when traditional production systems are subject to new economic and social pressures), individual users of the resource have very little, if any, incentive to conserve it.

Much of Africa's land and forest is not held as individual property, nor is use of such assets governed by social institutions which would control access and thus approximate a market mechanism. In much of Africa, low population density has historically mitigated any need to define individual property rights and create legal and organizational mechanisms to protect such rights. As population densities rise, property rights in some areas are being defined, particularly in important agricul-

tural areas. But in the Sahel (where the nomadic pastoral livelihood is based on access to common lands), and in forest areas, rapid population growth is contributing to permanent degradation of resources faster than institutional mechanisms to define rights and control access can be developed.

Quantitative estimates of the magnitude of the problem are available for forests and fuelwood. Estimates of wood resources in Africa vary widely, but as Table 7 suggests, annual supplies are declining or are expected to decline in all of Africa's ecological regions except in forested mountain areas where reforestation programs appear to be offsetting the growth of consumption. Table 8 gives estimates of the decline in the acreage devoted to forests and woodland.

In Africa, population growth is an important contributor to this decline. Only in a few isolated areas are industrial uses and commercial logging a significant cause of the increased demand for wood. In rural areas, as population increases, additional forestland and woodland is brought under cultivation to meet growing food needs. In some cases (for example, in Burkina Faso), fuelwood supply then increases, at least temporarily, as a by-product which farmers have difficulty in selling.

**Table 7. Wood Resources, by Vegetation Zones, Sub-Saharan Africa, Actual and Projected, 1960–2000**  
(million cubic meters in a given year)

Zone	1960 <sup>a</sup>	1980 <sup>b</sup>	2000 <sup>b</sup>
1. Desert and subdesert	1.39	0.94	0.22
2. Wooded savanna, heavily populated	165.14	138.98	117.0
3. Wooded savanna and some used forest, sparsely populated	272.89	260.67	249.00
4. Dense forests under population pressure	139.44	120.95	105.00
5. Dense forests not under population pressure	476.34	461.30	461.00
6. Forested mountain areas under population pressure with some reforestation	4.24	5.45	7.35
Total	1,039.54	988.29	939.57

a. Based on trend estimates using 1980 and 2000 figures from FAO (1983).

b. Adapted from several tables in FAO (1983). The figures include accessible and inaccessible wood resources, except for Zone 1, which includes only accessible wood resources. Ethiopia is excluded from Zone 6.

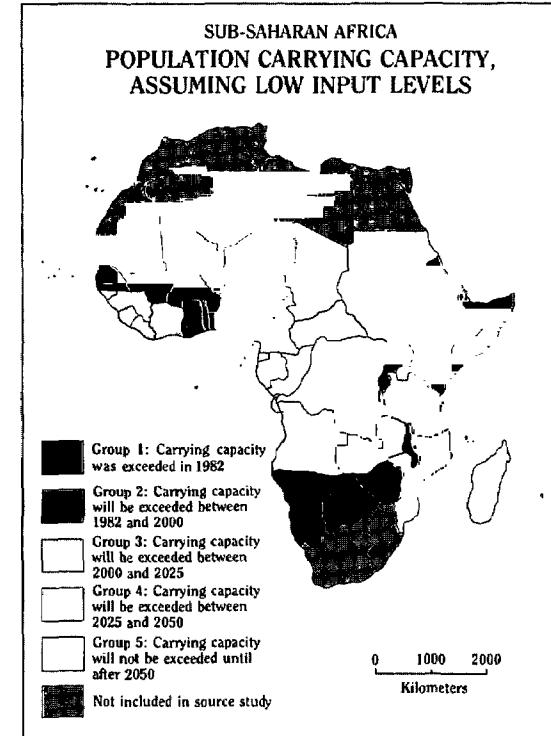
Source: Food and Agriculture Organization (1983), pp. 39–48.

### Box 3. Africa: Land, Food, and People

The FAO recently completed a detailed investigation of the potential carrying capacity of the world's farmlands—the number of people the land can feed at FAO and World Health Organization (WHO) standards for a minimum daily diet at various levels of farming technology. Such studies are only a rough guide to a country's ability to feed itself. For example, they exclude the possibilities of earning foreign exchange from nonfood exports and of importing food. But they provide a useful first approximation, particularly for Africa, where most people grow their own food.

The FAO's basic conclusion is that if Sub-Saharan Africa were treated as a unit, if all land with agricultural potential were devoted to growing food, and if technological inputs were low (roughly the same as those now used in most noncommercial African farming), Africa could support a population 1.6 times larger than its projected population in 2000 at WHO-FAO minimum-nutrition standards (see the table). "Low technology inputs" means ordinary seeds, rainfed cultivation, no fertilizer or other chemical inputs, no long-term soil conservation measures, and manual labor with hand tools. If technological inputs were raised to roughly the level used in more advanced parts of Latin America and Southeast Asia (intermediate technology) and if all land were used for food, in 2000 Africa could support nearly six times its projected population.

There are problems with this approach, however. First, treatment of the region as a unit assumes that movements of people and food across national borders and across regions within countries are costless. The picture is less sanguine at the country level. The map shows countries classified by the date when their population is projected to reach the level that the land could support with low technology inputs, still assuming that all potential farmland is



Note: *Low input level* is defined to include rainfed cultivation of the presently grown mixture of crops; local cultivars; no fertilizers and no chemical pest, disease, and weed control; significant fallow periods; no long-term soil conservation measures; manual labor with hand tools; high labor intensity, including uncotted family labor; low capital intensity; subsistence production; market accessibility not necessary; inadequate advisory services; and fragmented landholdings.

Source: Ho (1985).

used to produce food. In 1982 fourteen African countries that account for 50 percent of Sub-Saharan Africa's population, including Ethiopia, Kenya, and Nigeria, had already exceeded this

Fuelwood demand as the major cause of deforestation is most severe around large urban centers; as they grow, the land is denuded in increasing circles. Deforestation is less severe in areas of dispersed farms and is of little or no consequence in densely forested areas with small populations.

Deforestation can cause irreversible ecological damage. Most serious is the loss of soil fertility and soil erosion on deforested lands, which are caused

by the breaking of the nutrient cycle, of which trees are an integral part, and by diversion of animal dung and crop residues from use as soil fertilizer to use as fuel when wood becomes scarce. In its extreme form loss of soil fertility turns land into desert. If that happens on a large enough scale, it can reduce rainfall in the area and reinforce existing tendencies toward drought. (Some analysts believe that this factor helps to explain the severity of the recent drought in many parts of Africa.) In

point. Seven more, among them Ghana and Zimbabwe, are likely to do so by 2000. Of course, some countries, such as Kenya and Rwanda, have already achieved a level of inputs beyond the low level in some areas. But by the year 2000, with additional population growth, these two countries, along with Burundi, Lesotho, Mauritania, Niger, and Somalia, would not be able to feed themselves even at intermediate levels of technology according to the FAO calculation. In short, these countries will face increasing difficulties as populations double again in the next twenty to thirty years. Small land-locked countries such as Burundi and Rwanda face particularly serious problems. Population pressure has led to more intensive farming methods, based on higher and higher inputs of labor. But the remoteness of the countries and their terrain make it expensive to use advanced technologies and limit agricultural and nonagricultural export opportunities—and thus the scope for importing food. Low rainfall and remoteness also create considerable problems for such Sahelian countries as Niger.

Second, the shift from low to intermediate technology is not costless. Throughout Africa, traditional methods of farming require more land per capita than in regions such as Asia, where irrigation and double-cropping are more common. To avoid a fall in agricultural output per worker, land-scarce countries will require new technologies—fertilizers, improved seeds, and different farming techniques—and new investments, supported by pricing policies, to encourage production. Land, in short, is not enough.

Of course, it is neither necessary nor appropriate to try to satisfy future requirements for food solely through domestic food production. Food can also be imported if enough exports can be generated to pay for it. This option, however, requires significant industrial growth and exports, or strong growth of nonfood agricultural exports, some of which (for example, coffee and tea) face restricted markets. At the moment, much of Africa is pressed to finance from its limited exports the fuel and other inputs needed to sustain even modest economic growth.

Potential Population Carrying Capacity Ratios in Developing Regions

<i>Alternative levels of agricultural inputs</i>	<i>Africa<sup>a</sup></i>	<i>South- west Asia</i>	<i>South Africa</i>	<i>Central America</i>	<i>South- east Asia</i>	<i>Average</i>
<i>Multiples of 1975 population that could be supported</i>						
Low	3.0	0.8	5.9	1.6	1.1	2.0
Intermediate	11.6	1.3	23.9	4.2	3.0	6.9
High	33.9	2.0	57.2	11.2	5.1	16.6
<i>Multiples of projected 2000 population that could be supported</i>						
Low	1.6	0.7	3.5	1.4	1.1	1.6
Intermediate	5.8	0.9	13.3	2.6	2.3	4.2
High	16.5	1.2	31.5	6.0	3.3	9.3

a. Excludes South Africa.

Source: Higgins and others (1982).

addition, soil erosion from deforestation, as well as from the loss of perennial grass cover, can dramatically reduce the effective life of reservoirs and irrigation canals by increasing the rate of siltation. There are great uncertainties about the scale of such damage, but none about its direction. The Food and Agriculture Organization (FAO) estimates that unchecked soil erosion would reduce land productivity in Africa by 25 percent between 1975 and 2000.

Even before the worst ecological consequences of deforestation occur, the growing scarcity of fuelwood means rising fuelwood prices, especially in cities. In Ouagadougou, Burkina Faso, the real price of fuelwood jumped from \$2.5 a solid cubic meter to \$5.14 between 1970 and 1978—a real increase of over 9 percent a year. In Addis Ababa, Ethiopia, expenditures on fuelwood now claim up to 20 percent of the income of low-income households. (Even these prices are in a sense too low in

**Table 8. Annual Change in Hectares of Forest Area, Three Estimates (percent)**

Region	Forest and woodland (FAO 1980)	Forest (FAO/UNEP 1982)	Virgin forest (Myers 1980)
<b>Weighted average<sup>a</sup></b>			
All countries	-0.25	-0.54	-0.80
Africa	-0.51	-0.47	-1.40
Latin America	-0.29	-0.51	-0.34
Asia	0.05	-0.66	-1.56

a. Average of deforestation rates, rated by 1980 forest area of each country. This is a measure of average annual deforestation in each continent.

Source: Adapted from Allen and Barnes (1985).

that they do not reflect the replacement cost of trees.)

In rural areas, where there are few commercial markets for fuelwood, people have to go farther and farther afield to get their wood. Although no data show trends over time, the distance walked to collect fuelwood can be as much as 10 kilometers in some rural areas in Africa (Table 9). The task of collecting wood falls mostly on women, adding to already heavy demands on their time.

Increases in wood prices affect the urban poor more than other groups in society. Fuelwoods are the overwhelming choice for the poorest people in Sub-Saharan Africa, even in urban areas where a wider choice of fuels is available. In Nairobi, Kenya, more than 65 percent of the total energy used by the poorest households comes from fuelwood and charcoal, probably because, although fuelwood is a growing burden on household bud-

gets, it is still cheap compared with other fuels. The proportion drops to 19 percent of the highest income groups; the more expensive kerosene is preferred by households that can afford it. Rising wood prices and overall income gains, as well as increasing intensification of agriculture, will eventually break the link between population growth and deforestation. Meanwhile, population growth contributes to deforestation and severely burdens the poor.

In the long run institutions must be developed to provide for socially negotiated access rules to protect resources held in common. In the short run there are three options for tackling deforestation directly: substituting more expensive commercial fuels, conserving fuelwood (through pricing policies or better technology, such as fuel-efficient stoves), and planting more trees. None is easy under existing conditions. The World Bank (1983) has estimated that even if demand for fuelwood could be reduced by 20–30 percent through substitution and conservation, a fifteenfold increase in planting rates would be required in African countries to bring demand and supply into better balance by 2000. Given the difficulties of a successful forestation program, an increase on that scale is improbable. To avoid social and ecological disaster countries will have to act now not only to increase the supply of fuelwood but also to reduce demand. Among demand-reducing measures, slower population growth has a valuable part to play.

### *The Productivity of Employment*

The population of working age (15–64) in Sub-Saharan Africa was about 200 million in 1980 and is growing at a rate of about 3.2 percent a year. By 2000 it will have almost doubled, to 378 million, and by 2020 it could reach 700 million. Even under the low population projection, the population of working age would increase to slightly over 600 million in 2020. How can these additional people be employed productively? By how much will the demand for labor have to increase to avoid a decline in the productivity of labor and thus a decline in wages?

**AGRICULTURE.** Agriculture currently employs about 70 percent of the total labor force. Elsewhere, the process of economic development has

**Table 9. Average Distance Walked for Fuelwood in Some Rural Areas in Sub-Saharan Africa**

Country	Kilometers one way
Botswana	7.5
Burkina (Boulinga)	5
Burkina (Koudougou)	5–10
Cameroon (Yaounde)	2–6
Kenya	1.6–7.0
Malawi	0–3.6 <sup>a</sup>
Sudan (Bara)	1–10
Tanzania	1–5

a. For 90 percent of population. Remaining 10 percent collected fuelwood at distances greater than 3.6 kilometers.

Source: Barnes (1986).

involved a gradual shift of the labor force out of agriculture into higher-productivity sectors. In much of East Asia and Latin America, the decline in the absolute size of the agricultural labor force began in the 1960s or 1970s. Thus, in the Philippines and Malaysia about 50 percent of the labor force works in agriculture; in Korea and Brazil only 30 percent do.

In most African countries such a decline will not begin until well into the next century. Indeed, even taking into account continuing high levels of migration to urban areas, the absolute number of workers in agriculture in Africa will continue to increase rapidly and will double in the next two to three decades. In Kenya the number is likely to triple by 2025, even assuming rapid employment growth outside agriculture. By the middle of the next century nearly half (43 percent) of the world's agricultural labor force is projected to be living in Sub-Saharan Africa. As early as the end of this century, as the numbers of workers in agriculture increase, the average amount of land per worker, until then higher than the world average, will fall below the world average.

Elsewhere, the shift of labor out of agriculture has always been accompanied by substantial increases in the productivity of labor within agriculture and thus in average earnings, so that the shift has often occurred without any declines in total agricultural production. For the next decade or so, however, the task in African agriculture will be to increase total production rapidly enough to allow at least maintenance of current labor productivity and thus of average earnings as substantial numbers of new workers are employed. Agriculture's capacity to absorb more labor without declines in per worker output requires opening up new land or increasing nonlabor inputs for land already in use. Where new land of quality comparable to that now in use is developed, employment could grow at the same rate as output. Where land is scarce, more intensive farming is likely to bring slower growth of employment. A recent study (Hansen 1984) concluded that, at a given level of mechanization, a 10 percent increase in farm yields is associated with a 7.7 percent increase in labor use. In this section the same elasticity of labor with respect to output will also be assumed for complementary nonfarm employment in agriculture.

The FAO estimates that approximately 30 percent of the African labor force lives in countries

with unused land on which yields could approximate those on land already being cultivated. We assume that 30 percent of the agricultural labor force lives in such countries and that those countries could thus increase their farm employment as fast as their agricultural output, at least until 2000. The other 70 percent of the labor force is in countries which have to rely on more intensive farming and therefore can expect a rise of 0.77 percent in employment for each 1 percent rise in agricultural output. We also assume a constant share of wages in output. If all of the countries expanded their agricultural production by 2.5 percent a year for the rest of this century—the growth that they actually achieved in the 1960s and a higher rate than that in the 1970s—the rate of growth of agricultural employment would be about 2 percent a year, and an additional 70 million people could be employed in agriculture—although, at best, with only marginal increases in current average earnings per worker. Seventy million in agriculture would constitute about 40 percent of the total projected increase in the size of the labor force.

These estimates do not take account of how different price and trade policies could improve agricultural performance. For example, both developed and developing countries could ease protective tariffs and quotas against key export crops, politically difficult though that would be. Developing countries could raise their farm prices and provide farmers with more credit, technology, and access to markets. If agricultural production were then to increase at 3.5 percent a year or more (a growth rate that has been achieved on a sustained basis only in a few countries of East Asia) about 115 million new workers could be employed and the proportion of the labor force in agriculture would remain about the same as it is today. In short, substantial growth in output, at a rate higher than yet achieved in Africa, is required over a twenty-year period—and this would assure, at best, small gains in average earnings from current low levels.

**INDUSTRY.** Modern industry currently employs only 12 percent of the Sub-Saharan work force; the rate of employment growth has been declining in the past decade. A study of Côte d'Ivoire, one of Africa's most successful economies in the past two decades, estimated that in 1968 a 10 percent increase in industrial output resulted in a 7.7 percent

increase in employment; in 1974 the same increase in output resulted in a rise in employment of only 1.6 percent. In part, this change reflects an increase in the productivity of labor in industry. But it is also accounted for by price distortions—minimum wage legislation, capital subsidies, and overvalued exchange rates that encourage use of capital rather than labor—plus concentration on capital-intensive, import-substituting industries. Assume that these distortions were eliminated in African industry and the relation between output and employment was approximately at the level of the Côte d'Ivoire in 1968. In that case a steady growth in industrial output of 7.7 percent a year (compared with 3.9 percent a year in the 1970s in Africa) for twenty years would allow an annual 6 percent growth of employment in industry and would absorb 50 million more people between 1980 and 2000. Average wages for workers in industry would increase at a modest 1.8 percent a year.

For industry and agriculture combined, the number of extra jobs created by the end of the century could therefore be as high as 165 million or as low as 120 million (50 million plus 115 or 70 million). The remainder of the total projected 180 million—another 15 to 60 million—would find work in nonfarm rural employment, in the informal sector of the urban economy, or in government or modern services. Given at best modest increases in earnings in agriculture and industry, only modest wage increases in the other sectors could be supported.

The situation, although not hopeless, is thus grim. The prospects for even small gains in average earnings rely on much higher production growth rates in agriculture and industry than have recently been experienced. The prospects for major gains in average earnings are slim, even assuming short-term economic policy reforms. But if a fertility decline began now in Africa, earnings prospects would rise, beginning in 2000, all other things remaining the same. Africa would then be in the position enjoyed now by most countries in East Asia and Latin America, where fertility decline began fifteen to twenty years ago.

### ***Investments in Human Resources***

Investments in education and health are made by individual families and by governments. These investments obviously contribute to overall welfare,

and the evidence is that they also contribute to faster economic growth because a healthier, better-educated work force is more skilled, more entrepreneurial, and quicker to adapt to technological change. It is, in short, more productive.

At the family level, there is growing evidence that parents' investments of time and money in health and education per child fall as the number of children rises. Outside Africa, children from large families receive less education and do less well on school achievement tests than their peers from small families, even when differences in family income are taken into account. The disadvantage for children from large families is greater the poorer the family. In Nigeria, a study of children 10 and 11 years old found lower performance in school tests among children of higher birth order (that is, later-born children in large families). It may be that parents spend less time actively teaching and caring for each child if they have seven or eight children.

Obviously, some couples consider themselves and their families better off with additional children, even though they recognize that additional children are likely to reduce leisure, consumption, or school opportunities for the family as a whole. But to the extent that some additional births are not consciously wanted and could be prevented, it is likely that parental investments in health and education per child would increase as family size fell. Even without any change in public investments, an increase in private investments as a result of smaller family size would contribute to faster economic growth.

What about public investments, which are easier to track? During the 1960s and early 1970s governments in Sub-Saharan Africa devoted a growing share of GDP to education and health programs. Despite this effort most indexes of education and health are still significantly lower in Africa than elsewhere. In the 1980s the share in several countries leveled off or fell, largely because GDP growth slackened and the burden of foreign debt increased, squeezing the resources available for such programs.

The cost of raising educational and health standards depends heavily on population growth. The faster population grows, the more just maintaining existing standards is likely to cost. Most countries face a doubling of their total populations in about three decades and a doubling of their school-age

populations in two decades. According to rough projections, the cost of reaching universal primary education and rudimentary health services in fifteen years could reach as much as half the total expected government revenues in many countries.

To illustrate the benefits of slower population growth, this section looks at health and education costs for Senegal. It projects for 1980–2025 the public expenditures that would be needed to meet certain goals, under two assumptions about population growth—the standard projection and the slower population growth projection that was labeled the “slow case” in Chapter 1. Two different coverage goals are considered for primary education: continuation of the current proportion of population covered, and expansion to universal coverage by 2000. GDP is assumed to grow at 2.6 percent a year from 1983 to 2000 and at 3 percent a year thereafter, and government revenues are assumed to grow at the same rate. The unit costs of providing services are assumed constant over the period.

**EDUCATION.** In 1983 Senegal spent 5 percent of its GNP, 16 percent of government revenues, and 25 percent of its public recurrent budget on education. This expenditure financed a primary school enrollment of 53 percent, at a cost of \$114 for each enrolled student, and a secondary school enrollment of 12 percent, at a cost of \$436 for each enrolled student. These costs, although high compared with those in other developing countries, are comparable to costs in most other West African

countries. The primary school allocation took 8 percent of total spending, the secondary school allocation 7 percent.

The number of children of primary school age (7–12 years) in Senegal is projected to increase from 0.9 million in 1980 to 1.7 million in 2000 and to 2.2 million in 2025 under the standard projection. Under the slow population growth projection the numbers are smaller—1.5 million in 2000 and 1.6 million in 2025. With the standard projection of population growth and no improvement in coverage, the budget for primary education would nearly double by 2000 (Table 10). To achieve universal primary enrollment would require nearly a quadrupling of spending and an increase in the share of primary education in government revenues from 8 percent in 1980 to 22 percent. Even assuming that the share of secondary and higher education in all spending for education could be reduced, the minimum share of education in total government revenues would be at least 30 percent, a heavy burden.

The slower population growth assumption makes little difference in 2000; to attain universal primary education would still take up 21 percent of government revenues. By the year 2025, however, the budget for primary school alone would have to be 40 percent greater under the standard projection than under the slow population growth assumption (although, given the assumption of steady overall income and revenue growth, and the fertility declines built even into the standard population projection, the required share of primary

**Table 10. Senegal: Projected Primary School Costs and Share of Government Revenue under Alternative Population Growth and Enrollment Assumptions, 1980–2025**  
(millions of U.S. dollars)

Year	Standard fertility decline				Rapid fertility decline			
	Constant enrollment <sup>a</sup>		Expanded enrollment <sup>b</sup>		Constant enrollment <sup>a</sup>		Expanded enrollment <sup>b</sup>	
	Costs	Share of government revenues (percent)						
1980	54	8	—	—	54	8	—	—
2000	100	12	188	22	93	11	175	21
2025	133	7	251	14	95	5	179	10

— Not applicable.

a. 53 percent.

b. 100 percent by 2000.

education in government revenues falls). Even with slower population growth the 2025 budget would be three and a half times the 1980 budget. With slower population growth the government of Senegal would save more in 2025 than it currently spends on primary school education.

There are other steps Senegal can take to lessen the heavy strain on public revenues that these numbers imply. To reduce unit costs, class size could be allowed to increase, at least in urban areas. Teacher salaries can be increased more slowly than average incomes. The relatively large amounts spent on higher education could be reallocated to primary and secondary education if those privileged few who benefit from higher education were required to bear more of the costs of their own education.

Or, instead of pushing for universal primary education, the government could spend more per pupil to improve quality. The returns on improving school quality with the resources saved through lower population growth are likely to be higher than the returns to forced rapid expansion of the system if population growth does not slow. But improvement of quality will be difficult until a larger share of the population has access to basic education, and this goal will be delayed if the number of school-age children is constantly increasing.

**HEALTH.** Under the standard population projection the population of Senegal will increase from 6.6 million in 1985 to 10.1 million in 2000 and to 17.2 million, almost three times the current size, in 2025. Under the assumption of rapid fertility decline the totals are 9.2 million in 2000 and 13.1 million in 2025.

The government of Senegal currently spends \$5.00 per person on health, or roughly 5 percent of government revenues in 1983. With no increases in per capita spending or improvements in quality, government spending on health under the standard population projection would nearly double between 1980 and 2000 and in 2025 would be over three times the 1980 expenditure (Table 11). Under the assumption of rapid fertility decline the financial savings accrue slowly at first but build up considerably. By 2025 the savings from rapid fertility decline would be 20 million, over 65 percent of the government expenditure on health in 1980.

By 2000 the cost to Senegal of providing universal primary education and rudimentary health ser-

**Table 11. Senegal: Projected Health Costs and Share of Government Revenue under Alternative Population Growth Assumptions, 1980–2025**  
(millions of U.S. dollars)

Year	Standard fertility decline		Rapid fertility decline	
	Costs	Share of government revenues (percent)	Costs	Share of government revenues (percent)
1980	28.5	4	28.5	4
2000	50.6	6	46.0	6
2025	85.9	5	65.5	4

vices will constitute approximately 30 percent of expected government revenues under the standard population projection assumption. But current health standards in most African countries, especially in West Africa, are far from adequate. In some West African countries only 10 percent of the people have access to health services, and any improvements are likely to push up the costs of providing services considerably.

Faster economic growth and improved service efficiency would ease the problem of high costs. But other problems not considered here will also affect the ability of societies to provide education and health services to growing populations. In some countries a shortage of skilled administrators, even more than lack of funds, will be a serious constraint on the rate at which services can expand. On the one hand, governments need to spend more on each citizen's education and health to create the climate needed for fertility to fall. On the other hand, rapid population growth increases the size of the required spending and makes it difficult to spend more to improve standards.

## Conclusions

With sufficient capital, skills, managerial know-how, and technical improvements, the difficulties of rapid population growth could be ameliorated. Agricultural and industrial growth rates could be raised, soil conservation measures could be adopted, trees could be planted and protected to maturity, and educational systems and urban infrastructure could be improved. But the available financial and management resources are far from adequate for accomplishing all these tasks simultaneously.

#### Box 4. Savings and Capital Requirements for Rapid Population Growth

How much output workers can produce with available resources and capital depends on several factors, including how well the economy functions, what markets are available, the options in international trade, and institutional strength. A simple model with only two inputs, labor and capital, illustrates one aspect of the complicated reality.

The model assumes that each unit of labor needs a fixed amount of capital to produce, so that output is proportional to capital. The more capital is needed, the more savings are needed. Per capita output increases only if savings and thus capital accumulation are great enough to boost output faster than the population grows. The table shows the maximum population growth that can be sustained at constant per capita incomes, under various assumptions about capital requirements and current savings rates. The left-hand column shows different incremental capital-output ratios (ICORS), which measure the amount of extra capital needed to produce an extra unit of output. Where labor is scarce, as in developed countries, ICORS are likely to be higher, reflecting a greater reliance on capital to expand output. Ideally, labor-abundant economies should have lower ICORS. A combination of abun-

dant labor and high ICORS—the case in some developing countries—is likely to reflect inefficient use of capital. Such inefficiency results in slower growth in output for a given savings rate.

By the standards of other developing countries, savings rates in low-income Africa have been low and are declining; gross domestic savings averaged around 5 percent of GDP in 1979. ICORS in Africa range between 3 and 10, which implies that the maximum population growth rate for sustaining per capita income is 1.67 a year, well below the actual rate.

#### Maximum Population Growth That Can Be Achieved Compatible with Constant Per Capita Income under Constant Returns to Scale

Capital-output ratio	Savings ratio				
	0.05	0.10	0.15	0.20	0.25
2.0	0.0250	0.0500	0.0750	0.1000	0.1250
3.0	0.0167	0.0333	0.0500	0.0667	0.0833
4.0	0.0125	0.0250	0.0375	0.0500	0.0624
5.0	0.0100	0.0200	0.0300	0.0400	0.0500
10.0	0.0050	0.0100	0.0150	0.0200	0.0250

Source: Hansen (1984).

The requirements for faster economic growth in Africa include increased saving and more efficient use of resources. But in Africa savings rates have been low and are falling, and efficiency in the use of available capital has been low and is declining (see Box 4). Technical progress is restricted by shortages of skilled manpower and of organizational capacity, and potential economies of scale (for example, in agriculture) are difficult to realize even with complementary inputs.

Slower population growth, although it will not solve any of these problems by itself, will buy time: time to accumulate the resources, trained manpower, and know-how to implement solutions, and time for these solutions to take effect. In the short run it is the poor in general and women and children in particular who obviously benefit from lower fertility at the family level. In the long run societies as a whole would benefit from slower population growth.



## *Slowing Population Growth*

Many countries have already demonstrated the effectiveness of policies and programs for slowing population growth. Limited experience in Africa suggests that similar approaches will also work there. Africa has the advantage of being able to draw on lessons from other countries. The challenge for each African nation is to design population policies and programs suited to its own cultural, social, and economic circumstances.

Policies and programs can reduce fertility in three ways. They can influence, directly or indirectly, the benefits and costs of having children so that more parents will prefer smaller families. They can contribute to a social consensus on the legitimacy of family planning by providing information about the benefits of family planning and its proper practice. And they can support extension of family planning services so that parents can more easily avoid unwanted pregnancy.

This chapter discusses measures that strengthen the demand for smaller families and build a consensus about the legitimacy of family planning. It also assesses the potential demand for family planning services. Four approaches to strengthening demand for small families which have been effective and practical outside Africa are discussed: improving child health; expanding education, particularly for women; improving the status of women; and reforming laws and regulations that affect

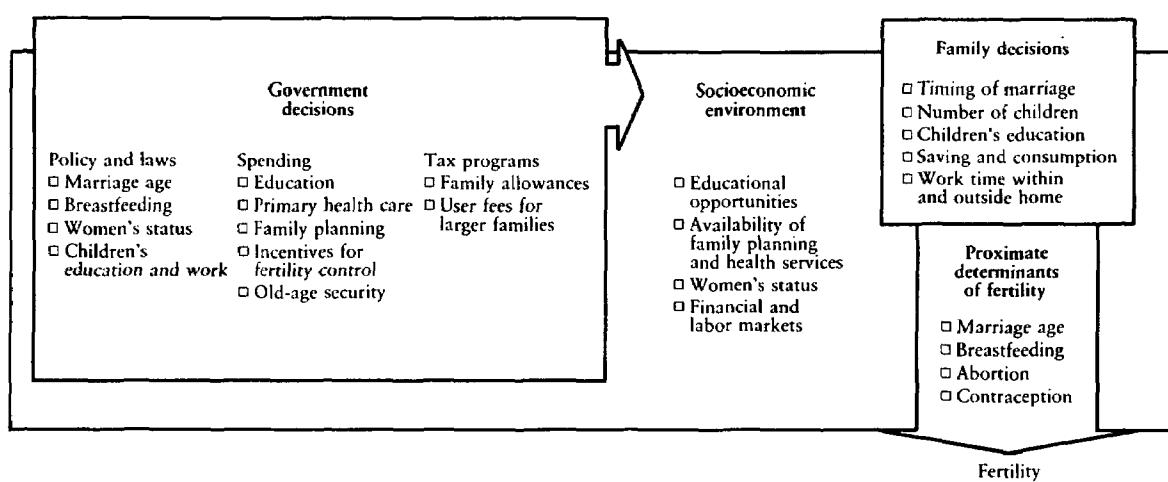
contraception. The chapter also discusses two less well-tried possibilities: user fees for social services, and direct incentives or disincentives for having children. Regarding consensus building, the chapter emphasizes the need for reaching men as well as women, and the young as well as those in the principal childbearing years. Finally, the discussion takes the view that there is a strong potential demand for family planning, on the basis of increasing evidence of widespread abortion and the fact that in the few places in Africa where good family planning services are readily available, a quarter or more of couples have chosen to use them, even in rural areas.

### **Strengthening Demand for Smaller Families**

As the 1984 *World Development Report* emphasized, any public policies that influence health, education, the status of women, and the economic value of children in turn influence individuals' attitudes toward childbearing, their interest in family planning, and their ability to control family size (see Figure 7). The question therefore is not whether government policies influence individuals but how and how much.

Most Africans earn their living from agriculture, and as Chapter 1 made clear, the conditions of traditional rural life, along with high infant mor-

**Figure 7. How Government Decisions Influence Family Decisions**



Source: World Bank (1984b).

tality, low literacy, and limited options for women, tend to increase the demand for children. Parents may find it in their private interest to have many children even though rapid population growth prejudices the development prospects of the nation as a whole. This is still more true if society relieves parents of part of the cost of raising children—for

example, by providing free or subsidized education and health care. Sharing the responsibility for raising children within an extended family—a common practice in much of Africa—has the same effect.

Actual fertility and desired family size are high in Africa (see Table 12). In the ten African coun-

**Table 12. Desired Family Size and Total Fertility Rates**

Country or region	Year of survey	Desired family size, by age of mother			Total fertility rate
		15–19	45–59	Total	
Benin	1981–82	7.2	8.0	7.6	7.3
Cameroon	1978	6.5	8.6	8.0	6.4
Côte d'Ivoire	1980–81	7.5	9.6	8.4	7.2
Ghana	1979–80	5.2	7.3	6.0	6.1
Kenya	1977–78	6.6	8.7	7.2	7.9
Lesotho	1977	5.6	7.3	6.0	6.0
Mauritania	1981	8.3	9.4	8.8	7.5
Nigeria	1981–82	8.2	8.7	8.4	6.3
Senegal	1978	8.3	8.4	8.3	7.1
Sudan (northern)	1979	5.4	6.5	6.4	5.6
Sub-Saharan Africa	1977–82	7.0	8.3	7.5	6.7
North Africa (three countries)	1978–80	4.1	5.2	4.4	5.3
Middle East (four countries) <sup>a</sup>	1976–79	4.3	6.2	5.2	6.8
Asia (ten countries) <sup>b</sup>	1974–78	3.2	4.3	4.0	4.7
Latin America (thirteen countries)	1975–79	3.3	5.5	4.3	4.7

Note: The total fertility rate is estimated for the period 0–2 years preceding each survey.

a. Three surveys conducted in 1978 or 1979.

b. Nine surveys conducted between 1974 and 1976.

Source: Cochrane and Farid (1985).

tries for which survey data on desired family size are available (see Box 5), actual fertility averaged 6.7 in the late 1970s—higher than in any other part of the world except the Middle East. Desired family size in these ten African countries averaged 7.5 children in the late 1970s, substantially higher than the averages for other areas.

As development proceeds, economies and cultures tend to evolve in ways that shift the calculus of private interest toward smaller families. Population policy is intended to speed up that change,

and it can do so in ways that guard private rights and help protect cultural values. Indeed, most effective policies to encourage smaller families actually protect traditional principles—for example, the principle that family welfare should be the main object of economic endeavor or that each member of a community deserves respect and protection. By increasing individuals' options, such policies may in fact do more to preserve these values than measures taken simply to maximize short-term economic growth.

### Box 5. The Demand for Children: Measuring Family Size Preference

Do survey questions about family size preference truly measure the demand for children? Some investigators have suggested that responses to questions about ultimate family size and intentions are meaningless or, at best, unreliable. They argue that many women in developing countries are not accustomed to planning their families or are uninformed about how to affect the number of births they will eventually have. Demographers use several measures of the demand for children, on the basis of survey responses. Two such measures are unmet need and desired family size.

Estimates of unmet need are derived from the nationally representative fertility surveys conducted in the past decade. Married women were asked, "Do you want additional children?" Women exposed to the risk of pregnancy (that is, they were neither pregnant nor infertile) who did not want more children and were not using any contraceptive method were defined as having an unmet need for *limiting* births. In a few surveys women were also asked, "Do you wish to delay pregnancy for a year or more?" Women at risk of pregnancy who replied yes and were not using any contraceptive method were defined as having an unmet need for *spacing* births.

Over time, 90 percent of the women responded consistently to the question on whether they wanted additional children, and their replies are reasonably good predictors both of contraceptive use and of future fertility. In countries surveyed as part of the World Fertility Surveys, contraceptive use among women who said they wanted no more children consistently exceeded use among women who wanted more children.

The criticisms about unreliability and validity of responses apply more strongly to questions on de-

sired family size—for example, "If you could choose exactly the number of children you have in your life, how many would that be?" This question contains significant hypothetical components, since women cannot choose family size costlessly, cannot have fewer children than they already have, and must imagine alternative life cycles that involve different family sizes. Responses to such a question are therefore often inconsistent when asked at two different times. For example, in Indonesia only 46 percent of women who were reinterviewed four months after an initial survey gave an identical response to the question on desired family size. Responses may also be nonnumeric ("Don't know" or "As many as God sends"). In Sub-Saharan Africa the rate of nonnumeric response was, on average, approximately 20 percent; the average for Asia, by contrast, was only 8 percent. The large percentages of nonnumeric responses to the question on desired family size have not been found to bias aggregate or age-specific averages of the desired number of children. Probability analysis for Bangladesh (where the nonnumeric response rate was 30 percent) suggested that the likelihood of providing a nonnumeric response was the same at all parities. Simulated estimates of desired family size for some African countries were similar to the means obtained from the direct question on desired family size.

The percentage of nonnumeric response is found to decline monotonically with either increasing development or increasing family planning program effort. As the means for controlling fertility become more widely available and acceptable, couples are increasingly able to think about and make decisions about family size.

## **Improving Child Health**

In the short run improving child health accelerates population growth; in the longer run it slows it down. Without improvements in children's health it is difficult to reduce the birth rate significantly. Measures to improve health and reduce mortality range from programs to educate mothers to policies to extend basic health care to all (see Box 6).

Higher rates of child survival reduce the need for parents to replace children who have died or to

have extra children to "hoard" or insure against the possibility of future deaths. Evidence from a study of twenty-five developing countries in all regions suggests that a fall in mortality of one child per family results in a fertility decline of almost 0.5 births after mother's age, education, and rural or urban residence are taken into account. The two African countries included, Kenya and Lesotho, each had an average fertility decline of just over 0.4 births for a fall in mortality of one child.

### **Box 6. Reducing Infant and Child Mortality: Policies and Programs**

The poor health of children originates in the poor health of their mothers. A young, malnourished mother has a weak baby who is prone to diarrheal or respiratory infections. In richer societies where mothers are educated and families have food, clean water, and health care, most babies survive easily. In poorer African countries, 15–20 percent of babies die by their first birthday and 25 percent die before they are 5 years old. With an early end to breastfeeding, the mother quickly becomes pregnant again and the cycle goes on.

Most Sub-Saharan countries are establishing basic health care systems that can both prevent and cure many of the common threats to health. They reflect:

- A shift toward maternal and child health, broader preventive health care, and more cost-effective curative measures
- A corresponding increase in training of nurses and basic health workers
- Extension of health services to small towns and rural areas on an outreach basis.

In technical terms these measures are comparatively simple—much can be done for a few dollars per capita a year. Evidence from pilot projects and primary health projects in developing countries indicates that marked health improvements can be achieved with annual operating costs of \$5–15 per capita, depending on the range of activities. Costs are higher when nutrition supplemental programs are included. As noted in Chapter 2, family planning itself can be a major contributor to improvements in child health.

Malnutrition is implicated in one-third to two-thirds of the most common health problems in many countries; the fraction is larger in areas with severe food shortages. In Somalia one-fourth of children under 5 years old have acute protein-calor-

rie malnutrition and about one-half of the women and one-third of the men are anemic. In Zambia and Zimbabwe about one-sixth of children under 5 years old are malnourished.

Malnutrition in Africa is so widespread that its treatment must be correspondingly comprehensive. Among the measures required are agricultural policies and programs (pricing, access to credit, inputs, and technology, and marketing assistance) to stimulate agricultural production, particularly among poorer farmers; targeted programs of food assistance and supplementation; and education on childspacing, breastfeeding, weaning, childfeeding, and hygiene.

Contaminated water (often a source of infection) and overall scarcity of water combine with lack of basic health services and poor nutrition to raise infant mortality. Mothers in rural areas who must fetch and carry their daily supplies of water hardly have enough clean water to protect family health. In Burkina Faso, for example, only one-fourth of the people have access to clean water, and only half the urban population has sanitation. The obvious remedies include programs for urban water supply and rural well digging, general sanitation programs in rural areas and sewage systems in urban areas, and health education.

Finally, educating mothers can do much to protect the health of children. Evidence from many developing countries shows that a child born to a mother with no education is twice as likely to die as one born to a mother with as little as four years of education. In Latin America infant and child mortality rates are five times greater among children whose mothers have no schooling than among those whose mothers have had ten years or more. The mother's education has a stronger impact on child health than does the father's.

These replacement figures do imply an overall increase in the number of children, at least for a time. But the longer-run effects, including, with some lag, parents' perception that they need not have extra children as insurance, are more important. As child health improves, and as prospects for education and real incomes grow brighter, people want fewer children so that they can invest more time and resources in each one. In the past three decades no country with life expectancy still below age 53 has experienced a sustained fertility decline; achievement of a sufficiently low level of mortality appears to be an important factor in sustained fertility decline. (But it is not the only or a sufficient factor; the few African countries that have exceeded this life expectancy have yet to show much decline in fertility.)

### ***Expanding Education***

Education, particularly for women, is one of the strongest influences on fertility. Education of young girls today is likely to lower future fertility as it expands women's opportunities. In addition, greater opportunities today to educate children may reduce current fertility as parents become more willing to limit family size to ensure an education for each child.

An educated woman is better equipped to take advantage of opportunities to work or to develop interests outside the traditional role. Educated women thus have to give up more if they choose to have six, seven, or eight children; they are more likely to compromise by having fewer children to make time for other things. Educated women are also more likely to delay marriage to finish schooling or to remain at work. Since children cost mothers more in time and energy than they do fathers, it is not surprising that education for women influences fertility more than does education for men. But educated women and men are also often more receptive to family planning messages and may be better able to follow some contraceptive regimes (for example, pills).

When educating children is a realistic possibility and leads to higher incomes, today's parents face a different choice. Among the urban elite of Africa, desire to assure education for their children is a prime cause cited for limiting family size.

A government that wishes to reduce fertility should assign an important role to the ministry of

education as well as to the ministry of health. Educational programs that support a policy to reduce fertility can be designed around four main principles.

**EXPANDING PRIMARY EDUCATION.** In most African countries budgetary constraints make it difficult to provide basic primary education without decreasing the share of public spending on secondary, vocational, and university education. This constraint need not imply a cutback in postprimary education, but it does imply that more of the costs of postprimary education will be shifted to parents through systems of fees and loans. To maintain quality, some governments may consider such measures as cuts in expenditures not directly related to the classroom—for example, boarding facilities and services, or school buildings. In some countries (Kenya, for example) parents often construct school buildings, while the government provides teachers and equipment.

**IMPROVING PRIMARY EDUCATION.** In much of Africa, dropout rates after just a few years of primary school are high, which implies great waste. Improvement of education could yield higher economic returns than expansion at current low levels of quality. Increased access to books and teaching materials, more in-service training, more supervision, and pay scales that reward performance may be cheaper in the long run than reducing the student-teacher ratio or having children spend more years at poorer schools. And if children are obviously benefiting, parents may be encouraged to keep them at school and may even be amenable to paying fees.

**INTRODUCING FAMILY LIFE CURRICULUM.** Many African governments increasingly advocate that time in school be spent on health and on education for family life. Family life education need not take much time, and human biology is a subject that effectively introduces broader scientific concepts. Discussions on the benefits of delayed marriage and on childspacing as part of responsible parenthood can help establish modern health and family planning as ordinary aspects of development. Several African countries, including Sierra Leone, Somalia, and Zimbabwe, offer such courses in some schools.

**INCREASING ADULT EDUCATION, PARTICULARLY FOR WOMEN.** There are no statistical studies of the impact of adult education on fertility, but programs of informal education provide a vehicle for changing attitudes and spreading information about family planning. Classes and discussions in natural meeting places—village centers, markets, and health clinics—can offer information on health and family planning. In some countries health workers are expected to do this job, but local teachers could probably be as effective.

### *Improving the Status of Women*

Enhancing the status of women economically and politically, and thereby expanding their range of opportunities, is of critical importance in strengthening the demand for smaller families. In Africa, the prevailing young age at marriage for women, the frequency of polygamy, an unequal work burden between the sexes, and the low educational levels of women all combine to perpetuate the low status of women. Although many African women provide the primary economic support of their children, mostly through subsistence farming and petty trade, their economic and social opportunities are largely circumscribed compared with those of men. There is strong social pressure on women to marry and produce children and thus extend the kinship network. An intense desire is created for family roles by community praise of the wife and mother and severe censure of the unmarried or childless woman. Early marriage, usually to older men, fosters the woman's feelings of dependence within the husband's family.

In the agricultural sector, the economic position of African women may have deteriorated in the past few decades. African women have traditionally had the right to cultivate one or more plots of land on which to produce food for family consumption and, if possible, a surplus for sale in the local market. In parts of Africa this is no longer the case. With formal land reforms and with increases in private property rights, women have lost cultivation rights. Men have become owners of the land, either as individuals or as heads of families, and women no longer have any claim to the land if the men want to dispose of it or if the women are widowed, divorced, or abandoned. Property and inheritance laws that deny women security of ten-

ure are likely to increase women's perceived need for children, and especially for sons.

Moreover, as the internal terms of trade moved in favor of cities in the mid and late 1970s, and as waves of rural men left to find city jobs, women's economic position may have deteriorated further. Rural women, often ignored by male agricultural agents, seldom made the transition to cash farming and nonfarm income-generating activities. In some countries more and more rural households came to be headed by women. In Kenya, nearly a quarter of the rural households are headed by women; in Botswana—perhaps an extreme case—a survey found that 41 percent of rural households were headed by women. Women who head their own households are presumably more dependent on children for child labor and for old-age security, which reinforces the traditional desire for many children.

Côte d'Ivoire, Ethiopia, and Kenya have recently given women the right to inherit and own property (see Box 7). In Côte d'Ivoire, the family code officially prohibits polygamy and dowry. In the Gambia, Kenya, and Tanzania there have been efforts, through government programs, to give women access to a wider variety of jobs and to credit and agricultural extension services. Legislative mandates and program design changes, however, have not always been equaled by assertive action. For example, in Ethiopia a 1975 proclamation provided for the distribution of land to the tiller. But since customary constraints make it difficult for women to gain access to cooperatives and credit facilities, allocation of land devolved largely to men.

Legislative change cannot in itself bring major changes in women's status in the short run. But in the long run it can help to broaden views of what is socially acceptable and encourage changes in attitude that will eventually contribute to changes in behavior. For example, legislation to raise the minimum legal age of marriage can encourage young women to delay marriage if they so wish, and it symbolizes the government's commitment to improving the status of women.

Legislative change can be supplemented by specific efforts to reorient government programs to better serve women. This is especially the case in agriculture. Measures can be designed to increase women's access not only to land but also to new production technology for food crops, basic skills training, credit, and cooperatives. This reorienta-

### **Box 7. Fertility and Women's Status: Change in Kenya**

A recent anthropological study of selected areas in five provinces of Kenya was designed to examine attitudes toward childspacing and birth control in rural Kenya and the forces that shape those attitudes. The study, based on discussions with small groups of women that covered specific areas of inquiry, suggests that changing sociocultural and legal circumstances that affect women, particularly bridewealth practices and land inheritance laws, are leading to a reduction in desired family size.

In parts of Kenya polygyny has declined and the practice of paying bridewealth has declined or has even been abandoned. These phenomena, along with greater nucleation of the family and increasing emphasis on the conjugal bond, are changing women's view of themselves and their family roles. High bridewealth is typical of most ethnic groups in Kenya and has been the main justification that husbands and their clansmen use in demanding a large number of children. Increasing economic pressure and education, however, have resulted in a decline in the payment of bridewealth or in the growing practice of the man paying the bridewealth himself with cash earned in wage labor. This change reduces parental influence, makes the marriage a more private affair, and thereby increases conjugal bonds. Greater freedom for spouses is also chang-

ing the relation between them, opening the door to greater husband-wife communication and to a greater influence of the wife in making family decisions, including decisions on fertility and family size.

Even more dramatic are new land and succession laws that give women property rights far superior to anything they enjoyed before. Changes in land inheritance laws from communal clan and lineage tenure to individual tenure are far advanced in all except the pastoralist regions of Kenya. New land laws are designed to protect women and children against landlessness. Such laws are meant to prohibit men from selling land which their wives and children need for subsistence and which ought to be eventually inherited by the children. A law of succession, passed in 1972 but not enforced until 1980–81, provides that all the dependents of the deceased—daughters as well as sons and widows—should inherit the property. If an individual dies intestate, all his children get equal shares of his property, which, in rural areas, is likely to be land. These succession laws, in addition to giving women more economic autonomy, also increase the man's consciousness of the economic cost of children, because every additional child decreases the size of the land bequest for each child.

tion will not be easy to bring about in the face of present attitudes and given the political weakness of women. Women will need to be trained as extension workers, teachers, and health auxiliaries and to become professionals, technicians, civil servants, and party officials. Needless to say, these measures can be justified on efficiency and equity grounds, quite apart from their contribution to reducing fertility.

Strengthening women's organizations, by expanding women's opportunities and providing outlets for women to assert control over their environment, can also help raise women's status. In several African countries women are establishing self-help organizations that build on communal traditions of cooperation. Such organizations can be more effective than individuals in obtaining credit, technical assistance, and help from government and other bodies. Women involved in such organizations often come to prefer smaller families and demand family planning. Nearly 22 percent of

the women belonging to Kenya's national women's organization, Maendeleo ya Wanawake, use contraception, compared with only 8 percent nationwide (see Box 8). Experience has been similar in such diverse settings as Bangladesh, Indonesia, and Mexico.

#### ***Changing Laws and Regulations That Affect Contraception***

Legislative changes can be useful in promoting smaller families. First, they can affirm that basic human rights include the right of each couple to determine the spacing and number of their children and can recognize that the practical exercise of this right requires access to family planning services and information. The U.N. World Population Plan of Action of 1974, which was reaffirmed in 1984, expressed these principles and is supported by almost all governments.

### **Box 8. Family Planning through Women's Organizations**

Kenya's largest women's organization, Maendeleo ya Wanawake, began providing family planning information in 1979. Maendeleo has some 7,500 local groups, with about 300,000 members, throughout Kenya. Its purpose is to develop projects to raise the living standards of its members. About half of its projects involve income generation (for example, raising poultry or pigs, ranching, or shop-keeping), one-fourth involve self-help (wells, house-building, and so on), 15 percent involve agriculture, and one-tenth involve health. Maendeleo members are gradually increasing their own economic resources, and about half of the groups own property.

According to a recent survey of women who attended meetings, some 90 percent of Maendeleo's members are farmers and housewives. About one-third had adult education, two-fifths had some primary education, and only a few had secondary education. About 25 percent have four or fewer children, 30 percent have five or six, and almost 50 percent have seven or more.

To emphasize the merits of childspacing, Maendeleo enlisted village volunteers to provide health and family planning education in a program that now reaches most members. The volunteers were trained for about two weeks and now hold discussions of family planning, often for at least half an hour, at regular meetings. The volunteers refer interested women to government or private clinics and sometimes go with them to reassure them. About three-fourths of Maendeleo members surveyed in five disparate areas where the program was operating had heard of family planning from these educators or from Maendeleo leaders. About two-fifths reported using contraception, compared with about 8 percent of women in the country as a whole.

Because Maendeleo members had difficulty in actually obtaining family planning services from clinics—clinics were far away, family planning workers were unexpectedly absent, and there was a lack of privacy, or thoughtless treatment—Maendeleo decided to test outreach programs that use women from local communities to help deliver services. Maendeleo now provides services through 80 dis-

tributors in two districts, Kakamega and Murang'a, and is expanding, with 260 more distributors, into four more districts in Central Province, Western Province, and Nyanza. The organization's efforts have attracted considerable attention among policymakers in Kenya, where Maendeleo members include members of Parliament and other political leaders. Maendeleo also has a seat on Kenya's National Council for Population and Development.

A number of other women's organizations, all on a small scale, have expanded family planning and women's opportunities with assistance from the IPPF. For example, in Lesotho, where many men work away from home most of the time, many households are, in effect, headed by women. In the Rankala area—twenty-eight remote mountain villages with 10,000 people who depend on male migrant labor and female subsistence farming—a rural development program was started with help from the family planning association. The community organized to provide space for clinics, build latrines, and establish kitchen gardens. It obtained assistance from the government and other sources for water, health care, and help with dairying, poultry-keeping, and production of hybrid maize, sorghum, and beans. Family planning services and information are being introduced gradually as part of basic health care.

In Togo the Tsevie Women's Pre-Cooperative, in collaboration with the family planning association, has promoted palm-oil production and soapmaking. Women lacked working capital and modern technology and could not purchase inputs in bulk or with a quantity discount. Early cooperative efforts helped remedy these problems and went on to improve literacy and health education. The women first involved have become a core group and are working to enlarge the program.

The Somalian Women's Socialist Union (SWSU) helped establish the national family planning association. The SWSU supports extensive family planning information programs in conjunction with a variety of efforts to improve women's income-generating capacity and health. It is active throughout the country at the village level.

Second, family planning can be extended by easing or removing unnecessarily severe restrictions—by legalizing contraceptives, widening the categories of people authorized to supply or receive them, and allowing commercial sale and advertising of

approved methods. In many African countries, for example, injectable contraceptives are generally not recommended unless a woman has five or more children, yet many women with fewer children could benefit from access to them. Rules re-

quiring women who want to be sterilized to be well beyond 30 years of age or to have four or five children may also be unnecessarily restrictive.

Many countries now include contraceptives on their lists of essential drugs that are provided by the national health system. Some allow certain oral contraceptives to be supplied or sold without prescription. In the Gambia and Zimbabwe, paramedical workers (with clinical backup) are allowed to supply pills to clients. Many countries now permit trained nonphysicians, such as midwives, to insert IUDs. Recent legal changes in Cameroon, Côte d'Ivoire, and Senegal include the repeal of a 1920 French law that prohibited advertising or providing information about contraceptives.

### ***Charging Fees for Social Services***

If parents in Africa bore more of the costs of raising children, they might choose to have fewer. One approach is to charge people for social services through user fees or by expecting parents to contribute in cash or kind to, for example, a new school or clinic.

As a general proposition, of course, raising the price of a service reduces its use. A government may not want to discourage the use, say, of primary schools or preventive health care, especially by the poor, who will most feel the burden of fees. But where such services are not yet available and public resources are scarce, charging fees can make services more available. Parents unwilling to send children away to distant free schools might willingly send them to a local school even at some cost to themselves.

A few African governments have tried to charge for curative health care, at least in areas where incomes are relatively high. Nigeria and Tanzania have imposed some school fees (Nigeria exempts girls) as a practical way to extend education, and parents now reportedly claim to want fewer children so that they can educate them. Whether these fees have discouraged enrollment is not yet clear. Certainly Tanzania has achieved outstanding enrollment; the vast majority of boys and girls are now in primary school.

If the benefits to society are sizable and private demand for the service is weak or is highly price-responsive—as is likely with primary education and some types of preventive health care in rural

areas—user fees will not be appropriate. But if demand is less responsive to price and fees would not significantly reduce the use of the service—as is often the case for curative medicine and secondary and university education in richer urban communities—fees are worth considering. The revenue from fees for curative health care can help subsidize preventive health care. And if higher-income families are concentrated in specific areas, it may be possible to charge them fees to subsidize services for the poor. Such approaches have been tried in parts of Kenya and are under consideration in Zambia.

### ***Incentives and Disincentives***

Incentives to delay or limit childbearing or to encourage contraception can be extended to individuals, couples, or groups. Such incentives can involve cash, goods, or services (for example, more schooling or life insurance). The transfer can be immediate or deferred—an example of the latter is a pension scheme, the amount of which varies with completed family size. Disincentives such as withdrawal or limitation of social benefits can also be applied—for example, by restricting paid maternity leave to two or three births or by allowing only first and second children preference in school admissions.

Incentives can help transfer to parents more of what society gains if the parents limit family size. But incentives and disincentives, particularly long-run or deferred incentives, can be costly and difficult to administer. Badly designed schemes may exert undue influence on the poor or uneducated and may penalize children, who have no control over parental decisions. Disincentives, especially, are only appropriate if several safe and effective kinds of contraception are readily available and understood.

So far, the only approach tried in Africa involves limitations on tax deductions, child allowances, and maternity benefits after the first few births. For example, Nigeria and Tanzania permit tax relief only for the first four children. Although such measures are useful as symbols of government concern, their direct demographic effect is small. They apply only to the relatively few people who pay income taxes or work in the modern sector, and many of those people already prefer small families. Other approaches—for example small payments

to couples who are willing to attend information sessions on contraceptive use—might be appropriate as the availability of family planning increases. But in general, until modern contraception is more widely available, incentives and disincentives are unlikely to be an important aspect of population policy in Africa.

### **Building a Consensus on Family Planning**

Information and education about population issues and family planning can help influence attitudes toward favoring smaller families. Information can come as part of family planning programs (discussed in the next chapter) or through broader channels—public speeches, group discussions, the press and radio, theater, films, schools, and agricultural programs. Information programs can explain the benefits to the nation, family, and individual of having fewer children. In Africa many information programs emphasize that modern contraception builds on the tradition of childspacing. Others explain the benefits of delayed marriage, encourage breastfeeding and longer birth intervals, dispel misunderstanding about contraceptives, and explain where to obtain them. Such programs help establish family planning as a normal aspect of development that respects the past but responds to today's circumstances. To be effective, information programs must be tailored to specific groups and social settings.

Building a consensus means that information should be directed not only at family planning acceptors, actual and potential, but also at political and community leaders (including tribal chiefs and religious leaders), senior family members, and physicians, nurses, and other health workers. If political and community leaders or the medical profession are not convinced of the need for family planning, they will discourage ordinary people and may even block the distribution of contraceptives. Senior politicians who speak out on the subject can be especially helpful.

Most countries have begun some information efforts designed to build consensus on the benefits of family planning. In Kenya and Tanzania, government leaders have spoken on the impact of rapid population growth on development and the need for family planning. In Kenya, Somalia, and Zambia women's organizations use community-

level meetings to discuss family planning. Kenya has sponsored information programs, using folk drama, for rural audiences. Benin has held poster contests in family planning and has established walk-in information centers around the country. Even countries where family planning services are just getting started—Burundi and Malawi, for example—have information programs. Private organizations, especially family planning associations, often assist governments or conduct information efforts on their own.

Relatively little effort has gone into specific programs to reach men or into group meetings for potential acceptors, community leaders, and political leaders. Such group meetings have proved promising where they have been tried. In Rwanda meetings have been held at national, district, and local levels (see Box 9). In Swaziland and Zambia the family planning association is beginning to discuss population and family planning with the country's tribal chiefs, and in Senegal the family planning association has met with Muslim leaders. The Global Committee of Parliamentarians on Population and Development plans a conference in Africa that will involve political leaders from most Sub-Saharan countries.

Information programs need to be backed up by two types of research: collection and analysis of demographic data to provide the factual basis for information programs, and analysis of alternative ways of getting population messages across (similar to market research in the introduction of new products).

### **Potential Demand for Family Planning**

Although demand for family planning in Africa is limited compared with that in other regions, it is far more extensive than was thought until recently. In the few places where family planning services are readily available, over one-fourth of couples choose such services, even in rural areas. If that pattern were repeated throughout Africa, birth rates would fall from close to 50 to below 40. But no more than one-fifth of African couples have ready access to good family planning services. Use tends to increase among women with more education, higher incomes, jobs in the formal sector, or other "modern" characteristics, and among women in urban areas, where contraceptives are more readily available (see Tables 13 and 14).

### **Box 9. Building Consensus in Rwanda**

Population issues and family planning programs have so far commanded less attention in francophone than in anglophone countries. The government of Rwanda, however, is trying to slow population growth, and it considers family planning services and information a priority.

In 1981 Rwanda established the Office National de la Population (ONAPO) to manage public information programs. The Ministry of Health has started to provide family planning services through its basic health centers in four pilot areas. The Catholic Church, which provides about 30 percent of the country's rural health care through its missions, also discusses family planning methods approved by the Church.

Rwanda's information programs emphasize the benefits of family planning to individual families and to the nation as a whole. Its strategy has been to reach general audiences with messages about population growth, the shortage of land, and parents' responsibility for providing a decent living standard for their children. The programs start from basic facts: half of Rwanda's families have eight or more children. The population is increasing at 3.4 percent a year, while per capita income—now about \$260—is increasing at only 1.7 percent. For ten years the government has emphasized through public statements that land pressure is an increasingly serious problem. Yet contraceptive prevalence among women aged 15–49 is only 0.9 percent according to the 1984 National Fertility Survey. ONAPO has therefore moved to enlist the help of influential members of society, both national and local.

In September 1982 ONAPO organized a national colloquium on "Family, Population, and Development" that was attended by 200 people, including religious leaders, doctors, and political and community leaders. At the community level, seminars on population and family planning for local officials have proved effective, easy to organize, and popular among men and women of all ages. The participation of local political leaders adds credibility and underlines the government's support for the program. It is hoped that the prefecture officials will then conduct local public meetings, and some have begun to do so.

Radio reaches about four-fifths of Rwandese homes, and since 1983 ONAPO has produced a popular weekly fifteen-minute radio program about the impact of rapid population growth and large family size. The program's format includes dramas, interviews, and discussions as well as lectures. ONAPO also records short "commercials," public affairs programs, and traditional-style topical songs. Information efforts in other media are still at an early stage; a few newspaper articles and brochures have been published, and a film and a play are in preparation.

ONAPO intends to move from general messages to detailed information for individual couples and specific groups and to make greater use of visual and written materials. It already has posters and other information on family planning in many health centers.

Four indications that the potential demand for family planning is more extensive than may appear at first glance are an unmet need for contraceptives, differences among groups in desired family size, rising rates of abortion, and the high use of contraceptives in some areas.

#### ***Unmet Need***

Up to 10 percent of the women in African countries have an unmet need for contraception: they want no more children but are not using contraceptives (see Table 15 and Box 5). The low estimate in table 15 includes only women who are using no contraception. The high estimate includes

women who are using no contraception or are using an inefficient method—with withdrawal, rhythm, or breastfeeding (within a year of a birth). Unmet need is lower in Africa than in other continents because African women tend to want many children, but wanting many children may itself reflect the general unavailability of a modern family planning option.

Estimates of unmet need would be higher if women were also asked whether they wanted more time between pregnancies. In studies in Bangladesh, Korea, and Peru in which this question was asked, the unmet need for spacing as well as for limiting births was substantial. In Bangladesh about one-third of the women wanted to space or

**Table 13. Use of Efficient Methods of Contraception among Currently Married Women, by Wife's Residence (percentage of women of childbearing age)**

Country or region	Survey date	Major urban	Other urban	Rural
Ghana	1979-80	11	7	4
Kenya	1977-78	18	8	4
Nigeria	1981-82	2	1	0
Senegal	1978	2	1	0
Sudan	1979	15	7	1
Sub-Saharan Africa (ten countries)	1977-82	6	3	1
North Africa (three countries)	1978-80	35	32	13
Asia (ten countries)	1974-78	26	21	12
Latin America (eight countries)	1975-78	33	30	21

Note: Efficient methods include pills, IUDs, condoms, injections, sterilization, and other modern methods but exclude traditional methods, notably rhythm and breastfeeding.

Source: Cochrane and Farid (1985).

limit births but were not using any contraceptive method, including breastfeeding or inefficient methods; about two-fifths wanted to space or limit births but were not using efficient contraceptive methods.

**Table 14. Use of Efficient Methods of Contraception among Currently Married Women, by Wife's Educational Level (percentage of women of childbearing age)**

Country	Survey date	Years of schooling			
		0	1-3	4-6	7+
Benin	1981-82	0	2	4	11
Cameroon	1978	0	0	1	10
Côte d'Ivoire	1980-81	0	2	5	5
Ghana	1979-80	2	6	7	14
Kenya	1977-78	2	3	6	16
Lesotho	1977	1	1	3	5
Nigeria	1981-82	0	1	1	6
Sudan	1979	1	10	11	32
Sub-Saharan Africa	1977-82	0.6	3	4	11

Note: Efficient methods include pills, IUDs, condoms, injections, sterilization, and other modern methods but exclude traditional methods, notably rhythm and breastfeeding.

Source: Cochrane and Farid (1985).

#### Differences in Desired Family Size

Current differences in desired family size among different groups imply future declines in desired family size and in fertility. Figure 8 illustrates the

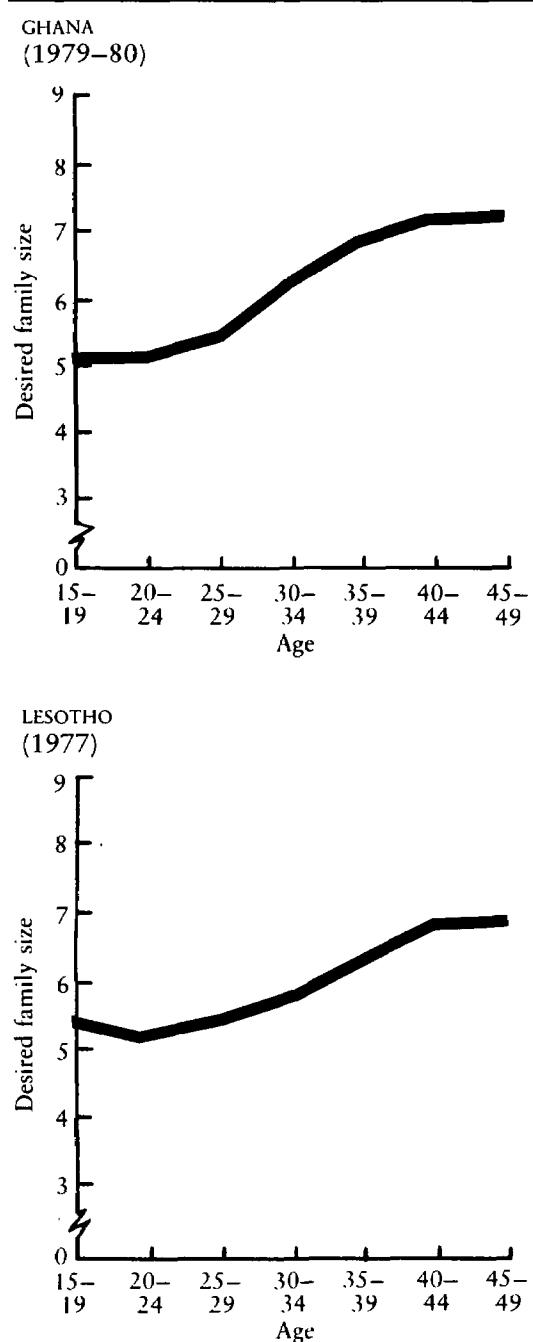
**Table 15. Unmet Need for Family Planning, Selected Sub-Saharan African and Other Countries (percentage of women of childbearing age)**

Country	Currently using contraception		Percent who want no more children	Unmet need	
	Year	Percent		Low estimate	High estimate
<b>Sub-Saharan Africa</b>					
Cameroon	1978	3	23	1	1
Ghana	1979-80	10	20	5	8
Kenya	1977-78	8	25	6	10
Lesotho	1977	5	26	5	9
Sudan	1979	5	27	6	9
<b>North Africa</b>					
Egypt	1980	24	58	12	22
Tunisia	1983	56	56	10	19
<b>Asia</b>					
Bangladesh	1983	25	50	25	28
Indonesia	1983	58	49	10	15
Pakistan	1983	14	50	17	27
Philippines	1981	48	59	11	29
Thailand	1983	59	68	13	17
<b>Latin America</b>					
Colombia	1983	55	69	7	24
Mexico	1979	39	61	14	22

Note: Low estimate: women who want no additional children and are using no contraception; high estimate: women who want no additional children and are using no efficient method of contraception.

Source: World Bank (1984d, 1985b).

**Figure 8. Desired Family Size, by Age, for Currently Married Women Aged 15–49**



Source: Data base for *World Development Report 1985*.

differences in desired family size, by age, in two African countries. If the preferences of younger women remain stable as they become older, average fertility will fall by one-fifth in Ghana. Desired family size is also lower in urban than in rural areas.

In Africa today women with at least ten years of education want, on average, 3.3 fewer children than women with no education. As the average education of African women increases, their desired family size and fertility will decrease. In Côte d'Ivoire enrollment of girls in primary school increased from 45 percent to 60 percent between 1970 and 1980. In Kenya the increase was even greater, from 50 percent to 95 percent. The effects on average fertility of these increases in average educational levels should begin to be felt in the 1990s.

#### *Abortion*

High and rising abortion rates, particularly among the young, also suggest an increasing demand for family planning. Most abortion in Sub-Saharan Africa is illegal (see Table 16) and dangerous, with high death rates. It is reasonable to suppose that women would prefer a safer, simpler option if they had it. In Chile, where modern means of contraception began to be widely available in 1965, the proportion of gynecological hospitalizations as a result of illegal abortion fell from about 20 percent to 14 percent between 1965 and 1978, and maternal deaths caused by abortion declined from 115 per 100,000 live births to fewer than 20. The proportion of women using contraception in Chile increased between 1964 and 1978 from about 3 percent to over 22 percent.

National data on abortion are scarce. The International Planned Parenthood Federation (IPPF) estimates that in Zaire the clandestine abortion rate is between 50 and 200 for each thousand live births. Many abortions there are performed primitively in unsanitary conditions. The IPPF reports that at the Mama Yemo Hospital in Zaire some 40 percent of gynecological cases admitted in 1972 were caused by induced abortion, and 75 percent of maternal deaths were consequences of induced abortion. In 1980 three-fourths of the women admitted to teaching hospitals in Zaire for complications from induced abortion were below the age of 20; reportedly about half of them died.

A study in Accra, Ghana, of women who had babies at a major urban hospital found that one-third of all those women with one previous pregnancy had ended it by abortion and that only 10 percent had then adopted contraceptives. Among women aged 20 or younger, 46 percent had had

**Table 16. Legal Status of Abortion in Sub-Saharan Africa**

Country	Illegal	Medical		Eugenic (fetal)	Juridical (rape, incest, others)	Social and social- medical	Legal (grounds not specified)
Benin		x					
Burkina	x						
Burundi	x						
Cameroon			x		x		
Central African Republic	x						
Chad		x					
Congo			x				
Côte d'Ivoire		x					
Ethiopia				x			
Ghana				x			
Guinea				x			
Kenya				x			
Liberia			x	x	x	x	
Madagascar		x					
Malawi		x					
Mali	x						
Mauritania	x						
Mozambique			x				
Niger	x						
Nigeria			x				
Rwanda	x						
Senegal		x					
Sierra Leone			x				
Somalia	x						
Sudan		x					
Tanzania			x				
Togo		x					
Uganda			x				
Zaire	x						
Zambia		x		x	x	x	x
Zimbabwe			x	x	x	x	x

Source: Tietze (1983), pp. 16-17.

induced abortions and about two-thirds ended their first pregnancy with abortion. But among women aged 25-29 only one-fourth said that their first pregnancy had ended in abortion. The more educated women also had more abortions; about 5 percent of women with no education reported that their first pregnancy ended in abortion, compared with 40 percent of women with secondary education and over half of women with university education.

A study of young unmarried people in Ibadan, Nigeria, found that 38 percent of female secondary school students were sexually active. Among all persons aged 18, half of the women and three-fourths of the men were sexually active. Only 48 percent of the sexually active men and 66 percent of the sexually active women had used contraception; nonusers overwhelmingly cited lack of

knowledge as the principal inhibiting reason, and concern over safety of modern contraception next. Of all sexually active young women in this study, 45 percent had had at least one pregnancy (62 percent among working women) (see Table 17). The great majority of adolescent women who had been pregnant elected to have abortions: 183 of 203 first pregnancies were terminated.

#### *High Use of Contraceptives in Selected Areas*

In a few places in Africa where family planning services are widely available, use of contraception is high. In Chogoria, Kenya, a rural area of 200,000 people where a pilot program provides easily accessible health and family planning services and careful followup, about 27 percent of couples use modern contraception, compared with

**Table 17. Sexual, Contraceptive, and Pregnancy Experience of Unmarried Women in Ibadan, Nigeria, 1982  
(percent)**

Category	Ever had sexual relations	Sexually active women		Pregnant women who ever terminated pregnancy
		Ever used contraception	Ever pregnant	
University (n = 285)	66	48	24	23
Polytechnic (n = 123)	52	27	28	26
Secondary (n = 346)	38	25	16	13
Working (n = 82)	91	54	62	51

Note: Women are dismissed from secondary school for pregnancy.

Source: Ladipo and others (1984).

roughly 8 percent for the country as a whole. In a rural project in Zaire the contraceptive prevalence rate (for modern methods only) is roughly 25 percent, against an average 3 percent for Zaire as a whole. Even at the national level, when programs are strong prevalence rates are high—Zimbabwe 27 percent, Botswana 19 percent—compared with a Sub-Saharan average of 3–4 percent.

This pattern follows one already established in other parts of the world. Family planning programs have been effective in a variety of cultural and economic settings—rural and traditional as well as urban and modern—throughout the world, as is shown in detail in *World Development Report 1984*. Isolating the separate impact of family planning programs on contraceptive practice requires that such other influences as income, maternal education, and child health be taken into account. Statistical analysis of cross-country data shows that, on average, previous fertility decline (which shows the pre-existing demand for contra-

ception) accounted for about one-third of the total fall in fertility between 1965 and 1975, socioeconomic change accounted for about one-fourth, and expansion of family planning programs accounted for more than either—about 40 percent. This conclusion is bolstered by the experience of several countries. In Indonesia and Thailand, which have modest per capita incomes and overwhelmingly rural populations, governments have made concerted efforts to bring family planning to local communities, and contraceptive use has risen. Family planning programs are not the only explanation, but they played a major role. In Bangladesh, Egypt, and Morocco, programs to bring family planning services to the community (and often to individual homes) have brought sharp increases in contraceptive use, even among the poor and uneducated. It is not surprising that good access through well-designed programs is also effective in Africa.

## *Expanding Family Planning Services*

Currently, only 3–4 percent of married couples in Sub-Saharan Africa use contraception (Table 18). But the evidence of potential demand discussed in the last chapter, the experience of small-scale area programs and pilot projects in such countries as Kenya and Senegal, and the recent rapid increase in contraceptive use in Zimbabwe (to an estimated current rate of 27 percent) suggest that if family planning services and information, especially about modern methods, were made widely available on a regular basis (for example, through systematic inclusion in maternal and child health services) overall prevalence rates in much of Africa could rise to 25 percent fairly quickly—within ten to fifteen years. This chapter describes the current state of family planning programs in Sub-Saharan African countries and discusses steps to ensure rapid program expansion.

### **Existing Family Planning Services**

In most developing countries family planning programs have evolved in a fairly regular pattern. At the outset, private organizations introduced family planning and demonstrated its acceptability. Eventually, government programs were set up, usually as part of health ministries, but private organiza-

tions continued to provide services and build public support for family planning. As demand for family planning has grown, commercial suppliers have also responded, especially in cities, where demand tends to be stronger and operating conditions easier than in rural areas.

Contrary to the conventional view, central governments have not been the only or even the principal providers of services. Local governments and communities, private health organizations and women's groups, private health practitioners, and commercial suppliers have all played roles, especially in Latin America and East Asia. In Colombia the family planning association (which pioneered service delivery) provides about two-fifths of family planning services, and the commercial sector is also important. In Bangladesh, Brazil, Mexico, Thailand, and most other countries with extensive family planning programs, local governments, private organizations, and commercial suppliers are active. In Africa, the critical role of private non-profit family planning associations, women's and other organizations, and subsidized distribution of contraceptives by the private sector ("social marketing") in supplementing direct government provision of services is already evident in various countries (see Table 19).

**Table 18. Current Use of Contraception among Women Aged 15–49, Selected Countries in Sub-Saharan Africa**

Country	Year	Contraceptive prevalence rate (percent)
Cameroon	1977–78	3
Ethiopia	1982	2
Ghana	1979–80	10
Kenya	1977–78	8
Lesotho	1977	5
Nigeria	1983	6
Senegal	1978	4
Sierra Leone	1982	4
Zaire	1982	3
Zimbabwe	1984	27 <sup>a</sup>
West Africa	1983	4
East Africa	1983	3

a. For women aged 15–44.

Source: Westinghouse Social Sciences International Demographic Data for Development; World Bank data files.

### **Government Programs**

Basic health care should in principle include family planning services at clinics or health posts. In practice, this situation is still relatively rare in Africa. In only a few countries, for example, Botswana, is family planning in fact fully integrated with other health care, from the top of the system to the local delivery point. In Zimbabwe family planning, although handled separately, is widely available through outreach workers who report to their own supervisors in a system parallel to health services. Other possibilities include specialized outreach workers reporting to clinical nurses who cover family planning and other maternal and child health needs and specialized educators on family planning who refer interested people to health workers for services.

**Table 19. Overview of Family Planning Programs, Selected Countries in Sub-Saharan Africa**

Country	Government MCH/FP	Government outreach	FPA	Other major NGOs	Substantial adolescent program	Social marketing
Botswana	x		x			
Burkina	x		x			
Burundi	x			(x)		
Cameroon	(x)					
Ethiopia	x		x			
Ghana	x		x	x	(x)	
Kenya	x	(x)	x	x	(x)	
Lesotho	x		x	(x)		
Liberia	x		x	x	(x)	
Mali	x		x	x		
Malawi	x			(x)		
Niger	(x)				(x)	
Nigeria	x	(x)	x	x	(x)	(x)
Rwanda	x		x	x		
Senegal	x		x	(x)		
Sierra Leone	x		x	x	(x)	(x)
Somalia	x		x	(x)	(x)	
Sudan	(x)		x	x		
Tanzania	x		x	x	(x)	
Togo	(x)		x	x	(x)	
Uganda	x		x	(x)		
Zaire	x	(x)	x	x	(x)	
Zambia	x		x	x		(x)
Zimbabwe	x	x	x	x	x	

Note: MCH/FP, maternal and child health and family planning; FPA, family planning association; NGO, nongovernmental organization. Parentheses indicate a less extensive effort.

Source: World Bank (1984d); UNFPA (1982–83); IPPF (1983); Proceedings of the U.N. International Population Conference, Mexico City, August 1984.

Private organizations, commercial distribution, and social marketing efforts tend to be greatest in urban areas. If rural areas are also to be served, it is likely that government efforts will have to be substantially increased in those areas. This is most feasibly and usefully done through the expansion of the network of health clinics and outreach services in rural areas.

### ***Family Planning Associations***

National family planning associations (FPAS) are affiliated with and partly supported by the IPPF, a private nonprofit international organization. There are local family planning associations in twenty-five countries in Sub-Saharan Africa, and many have a close relation with the government:

- The governments of Ethiopia and Tanzania rely on their FPAS to train government health workers in family planning and to help procure contraceptives.
- FPAS in Mali and Zambia also help with training and procurement. Zambia's FPA collaborates in information programs with the leading political party and the women's organization and organizes self-help clinics; Mali's works with the National Union of Mali Women and worker and youth organizations and broadcasts fifteen-minute programs on the government radio network.
- Zaire's FPA—itself a government institution—coordinates the family planning element of a broad health program that is now getting underway and that includes provision of contraceptives to 200 outlets throughout the country.
- Uganda's FPA has been asked by the government to handle family planning. The government is extending services, but the FPA is still the main source, with sixty urban clinics, thirty-seven of which are in health ministry facilities.
- In Zimbabwe the FPA has become a parastatal (called the Zimbabwe National Family Planning Council) under the Ministry of Health; it is extending family planning throughout the country.

### ***Women's and Other Organizations***

Women's organizations create demand for family planning by improving women's basic skills and income-earning capacity; they can also directly provide family planning information and services. The leading women's organization in Kenya,

Maendeleo ya Wanawake, has been providing family planning information nationwide and has also undertaken outreach pilot programs (see Box 8 in Chapter 3). The largest women's organizations in Zambia and Somalia are starting such a program on a national scale. The women's branch of the Zimbabwe African National Union (ZANU) has provided critical support to family planning.

Many other bodies are also involved in family planning. The Presbyterian Church in Kenya has pioneered family planning and other health care programs in both rural and urban areas. In Zaire church organizations are introducing voluntary sterilization in fifteen hospitals as part of basic rural health services. Universities in Kenya, Nigeria, and Sudan have sponsored or assisted with family planning pilot projects. Tanzania's national workers' organization cooperates with the family planning association to provide services and information to its members. Somalia and Zaire are beginning similar programs that involve in Somalia the Labor Ministry and the General Federation of Somali Trade Unions and in Zaire the national union of workers. Zimbabwe's Youth Advisory Service works with schools and several youth organizations. The YMCA and YWCA have small activities in several countries. Sierra Leone's Home Economics Association works with the FPA to provide contraceptives at markets, factories, and public gatherings.

### ***Commercial Suppliers***

Limited demand, dispersed populations, and difficult operating conditions currently inhibit the commercial provision of contraceptives in Sub-Saharan Africa. But despite such difficulties, the commercial sector does play a role. Social marketing programs, under which the government or a non-profit group subsidizes the commercial distribution of contraceptives, particularly condoms, operate in Ghana, Kenya, Liberia, and Tunisia. There is substantial scope for more social marketing, since networks of shops and pharmacies exist throughout much of Africa. In Zambia the professional pharmacists' organization will soon be undertaking a major effort, the subsidized sale of several million condoms a year. In Nigeria a pharmaceuticals firm will be introducing subsidized distribution of condoms and pills through pharmacies and shops, also on a large scale. In Somalia, where

health care is particularly scarce, social marketing, for which plans are under way, may be a practical way to begin extending supplies of contraceptives.

The main risk of social marketing programs is that people will not use contraceptives properly or will suffer unexpected side effects. This risk can be reduced by providing pharmacists and shopkeepers with information on contraceptive methods and enlisting their help in educating their clientele. It can also be reduced by closer cooperation between family planning organizations and private commercial channels to ensure that users understand methods and can get help to deal with side effects.

### Issues in Expansion

To expand family planning more rapidly, program planners in Africa can broaden the clientele served, broaden the choice of contraceptive methods, emphasize outreach to complement clinical services, and avoid "crowding out" of nongovernment programs.

#### Clients

There are five groups of potential clients: young people, including teenagers, women of prime childbearing age who are concerned with frequency and timing of pregnancy ("spacers"), women who wish to cease childbearing ("stoppers"), infertile women, and adult men. Most programs in Africa concentrate only on spacers.

**YOUNG PEOPLE.** Despite the hazards to mother and child of teenage pregnancy, government family planning programs seldom address young people. Married teenagers are rarely given counseling that would help them delay the first pregnancy until the woman is past the high-risk years. Unmarried teenagers are a more delicate problem. In some countries people fear that information on family planning will encourage teenage sexuality. Others point out that including family planning as part of broader education for family life can encourage more responsible sexual attitudes. Such education is already being provided in a number of countries, including Nigeria, Somalia, and Zimbabwe.

**SPACERS.** Despite their desire for large families, most African women recognize the value of child-

spacing and have traditionally used breastfeeding and sexual abstinence to achieve it. Such women will be interested in more effective modern methods suitable for spacing—pills, condoms, injectables, and IUDs. The extensive family planning programs of Zimbabwe (which relies largely on pills) and Botswana appeal primarily to women who want to space births. In Botswana the typical acceptor is an unmarried woman aged 20–24 with one child.

**STOPPERS.** As women start wanting fewer children and become more familiar with modern contraception, they will grow more interested in long-term methods, including sterilization. Waiting lists for sterilizations in Nairobi are now several months long, and the government of Kenya plans to offer sterilization services throughout the country. Sterilization is being introduced on a pilot basis in Mali, Nigeria, Sudan, and Zaire. Programs should anticipate this trend, since sterilization is effective and safe if properly carried out. In China, El Salvador, India, Sri Lanka, and Thailand over 17 percent of couples of reproductive age have chosen sterilization; in the Dominican Republic and Panama the figure is over 27 percent and in the United States it is over 30 percent.

**INFERTILE WOMEN.** Infertility can be a personal tragedy for the individual woman, and where infertility is widespread the uncertainty in childbearing reduces interest in birth planning of any kind (see Box 10). Family planning programs can help prevent infertility and secondary sterility by disseminating information on the causes of sterility and by making contraception readily available so that couples can prevent unwanted pregnancies that might result in abortion and possible complications.

**MEN.** In Sub-Saharan Africa, as elsewhere, traditional male attitudes inhibit family planning. Programs have therefore focused on women, who are considered more responsive and more directly involved in childbearing. Yet male attitudes affect women's decisions on contraception, and family planning is obviously the responsibility of both parents. Much more attention to men's attitudes could help to encourage family planning. Among national programs, only Botswana and Zimbabwe offer information and services for men. Kenya, So-

#### **Box 10. Infertility: A Challenge to Programs in Sub-Saharan Africa**

Surveys in the 1950s and 1960s found that an average of 12 percent of women who had passed their childbearing years in eighteen Sub-Saharan countries were childless, compared with a rate of 2 to 3 percent in other developing countries. Childlessness—"primary" infertility—was greatest in the Central African Republic (17 percent), Cameroon (17 percent), Zaire (21 percent), Congo (21 percent), and Gabon (32 percent). In parts of Zaire, as many as 65 percent of women aged 45 to 49 were childless. Childlessness in younger age groups is less common (presumably owing to improved medical care) but still high. In Cameroon 10 percent of women aged 30 to 34 are childless; in the Congo the figures are 12 to 13 percent. In addition, large numbers of people suffer from "secondary" infertility—the inability to conceive or give birth again following an earlier birth. Studies in Kenya have shown that primary and secondary infertility occur with approximately equal frequency, while in much of West Africa secondary infertility accounts for up to two-thirds of diagnosed cases. Secondary infertility afflicts 14 to 39 percent of women aged 15 to 50 in different regions of Cameroon.

The consequences of infertility are particularly severe for women, who may be ostracized, abandoned, or divorced. Fear of infertility makes couples reluctant to practice modern contraception. Thus, although high infertility keeps fertility lower than it otherwise would be—every 9 percent increment in childlessness reduces total fertility by about 1—it also inhibits contraceptive use and slows eventual fertility decline.

What causes high levels of infertility? Sexually transmitted diseases, particularly gonorrhea and syphilis, are major causes of both primary and secondary infertility. Gonorrhea, if left untreated, can lead to irreversible blockage of the fallopian tubes in women and of the vas deferens in men. Because the symptoms are not readily noticeable in women, it may go for several years without treatment. Syphilis causes miscarriage and stillbirth. Poor obstetrical care and unhygienic abortion are additional causes of secondary infertility. Malnutrition, congenital defects, genital tuberculosis, and various uterine, vaginal, and urethral infections also contribute.

Treatment for infertility is costly and difficult; even then, the outcome is uncertain. Depending on

the cause, only one-quarter to one-half of couples treated may subsequently have a live birth. Three major causes—sexually transmitted disease, poor obstetrical care, and illegal abortion—can be prevented at less cost. Public campaigns can inform couples of the causes of infertility, the symptoms of sexually transmitted disease, its prevention through limiting sexual partners and use of barrier methods of contraception (especially condoms), and the availability of treatment. These informational efforts need to be directed to men in particular, since they are more reluctant to submit to infertility tests and treatment. Though women are usually held responsible for childlessness, in fact they account for about 40 percent of infertility cases. Men account for another 40 percent, with both partners being infertile in the remaining 20 percent of cases. When the infertility is caused by sexually transmitted disease, it is essential that both partners be medically treated. Other causes of infertility can be prevented by improving the quality of obstetrical care, (for example, by training traditional midwives) and by increasing the availability of contraception so that couples can prevent unwanted pregnancies that might result in abortion.

There are few specialists or centers for diagnosis and treatment of infertility in Sub-Saharan Africa. Since 1973 infertility clinics have been set up in Cameroon, Kenya, Tanzania, and Uganda. Programs to control the spread of sexually transmitted disease have been launched in the Central African Republic, Ethiopia, and Zambia. The Association for Voluntary Sterilization has provided grants for research, treatment, training, and public education on infertility in Nigeria, Sierra Leone, and Sudan.

Resources are needed for research into the causes and treatment of infertility, as well as for better data on its prevalence. About \$4 million of a total of \$6 million spent by the public sector on infertility research worldwide in 1982 went for research into unexplained causes of infertility; the bulk of this work was conducted by the Center for Population Research in the United States. Total spending on infertility research by the World Health Organization in 1982 was only \$900,000. The United Nations Development Programme has proposed increasing this amount to \$2–4 million a year over the next five to seven years.

malia, Tanzania, Zaire, and Zambia, among others, are beginning family planning programs for organized workers. And some family planning associations—in Ghana, Kenya, and Tanzania, for example—have begun programs for men to persuade governments to expand their own efforts.

### **Contraceptive Methods**

Because contraceptive technology has improved considerably over the past twenty years, countries in Africa have an advantage over their counterparts in Asia and Latin America at a comparable early stage of family planning. Promising new contraceptive methods such as injectables and implants have emerged, and pills, IUDs, and sterilization are all safer and easier to use. Each modern method has particular advantages and disadvan-

tages (Table 20), but none is unsafe with proper use. Indeed modern contraception is safer than childbearing. In Sub-Saharan Africa, of 100,000 women who use the pill, one may die; but of 100,000 women in childbirth, between 200 and 600 die. Even in such countries as the United States, where health care is better than in Africa, women who do not use contraception and are thus subject to the hazards of pregnancy and childbirth are at a greater risk of death than women who use contraception.

The client's choice of contraceptive methods is limited in Africa. Pills and condoms are the most widely available (although less so than in other developing regions). Female barrier methods (foaming tablets) are being introduced in only a few countries. Injectables are often offered only on a highly restricted age and parity basis. The gov-

**Table 20. Contraceptive Technology**

<i>Method</i>	<i>Major advantages</i>	<i>Major disadvantages</i>	<i>Comment</i>
Pill	Effective Unrelated to coitus Helps protect against anemia, PID Can be provided nonclinically	Some side effects (Small) mortality risk Must take daily Not indicated for adolescents	Progestin-only pill more suited to breastfeeding mothers Protective effect against anemia, PID especially helpful in Sub-Saharan Africa
IUD	Long term Effective Unrelated to coitus	Does not protect against ectopic pregnancy Associated with some increase in bleeding, PID Requires more clinical backup	Newer forms much improved Can be inserted postpartum Bleeding, PID, and ectopic pregnancy particularly troublesome in Sub-Saharan Africa
Condoms	Nonsystemic Easily stored No side effects	Not always effective in use May reduce pleasure	
Injectables	Long acting Not related to coitus Can be provided nonclinically	Minimal side effects Removal of implants requires clinical backup	Not officially approved as contraceptives everywhere
Female steriliza- tion	Effective Unrelated to coitus	Virtually permanent	Minilaparotomy very safe on outpatient basis
Male sterilization	Effective Unrelated to coitus	Virtually permanent	Cultural resistance in Sub- Saharan Africa
Rhythm and other natural family planning	No side effects Approved by Catholic Church	Relatively ineffective in use because of difficulty in calculating safe period or reluctance to abstain before and during that time	Determining time of ovulation can be difficult if thermometer not available Checking mucus in absence of clean water not hygienic
Breastfeeding		Relatively unreliable for the individual	Inhibits ovulation but not with enough predictability to recommend for individual women

*Note:* PID, pelvic inflammatory disease.

*Source:* Centers for Disease Control (1983).

ernment of Kenya has decided to introduce nationwide facilities for sterilization, and sterilization is being introduced on a limited scale in about ten countries, but restrictions are strict. Typically a woman must be well over 30 years old and have four or more children, and she may need her husband's consent. Although there are good reasons to be cautious about sterilization (so that people do not come to regret their decision), many who would really benefit are excluded if restrictions are too great.

The use of contraceptives can be considerably expanded by increasing their variety and easing restrictions on the use and provision of various methods. Younger women typically favor pills or barrier methods; older ones may prefer methods such as IUDs that are long-term but not permanent. New implants, which last several years, will appeal particularly to women who desire to cease childbearing.

From the perspective of delivering services, non-physicians can safely and effectively provide pills, condoms, foaming tablets, and even injectables (although for pills and injectables there should be either medical supervision or referral services to check for and attend to side effects). Implants require medical facilities, especially for removal.

Sterilization requires physicians and medical facilities, although it can be done through mobile clinics. Table 21 shows the most recent pattern of contraceptive use in several developing countries.

### **Outreach**

The greatest drawback of clinic-based health and family planning is that clinics are passive—they offer services only to those who seek them out. They work reasonably well for curative health care, for which demand is strong, but less well for preventive health care, including family planning. Perhaps as a result, few people start family planning at clinics, and in many programs more than half of those who do, stop within a few months. In Botswana, which has a relatively strong clinic-based program, about two-thirds of users fail to return after a year.

In outreach systems, community health workers actively seek clients and then keep in touch with them. Workers with limited training bring family planning and other basic health care regularly to neighborhoods or even individual households. Outreach is not a substitute for clinical care; it should have clinical backup. But it can relieve clinics of some front-line work.

**Table 21. Contraceptive Prevalence, by Method**  
(percentage of fertile-age couples using contraception)

Country	Year	Age group	Total <sup>a</sup>	Sterilization				Injectables	IUDs	Other <sup>b</sup>
				Orals	Condoms	Male	Female			
<b>Sub-Saharan Africa</b>										
Cameroon	1978	15–49	3.1	0.3	0.2	...	...	...	0.2	2.3
Ghana	1979–80	15–49	9.6	2.4	0.6	...	...	0.5	0.3	5.8
Kenya	1977–78	15–49	8.0	2.4	0.2	...	1.0	0.6	0.8	2.8
Lesotho	1977	15–49	5.0	1.2	0.1	0.0	0.8	0.2	0.1	2.5
Nigeria	1981–82	15–49	5.7	0.4	0.1	0.0	...	0.0	0.3	5.0
Senegal	1978	15–49	4.0	0.3	0.1	0.0	...	0.0	0.2	3.5
Sudan (north)	1979	15–49	5.0	3.4	0.2	0.1	0.3	0.2	0.1	0.8
Zimbabwe	1984	15–44	27.0	80.0 +	...	...	...	...	...	...
<b>Other countries</b>										
China	1982	15–49	71.0	5.8	1.5	7.1	18.0	...	35.6	2.9
Colombia	1980	15–49	49.0	17.0	...	11.0	...	...	8.0	13.0
Egypt	1980	15–49	24.0	16.3	...	...	...	...	4.1	3.6
Indonesia	1981	14–55	36.2	22.5	...	1.0	...	0.6	10.0	2.1
Mexico	1979	15–49	38.9	13.1	0.9	9.2	...	2.6	6.1	7.0
Thailand	1981	15–44	59.0	20.2	1.9	4.2	18.7	7.1	4.2	2.7

... Zero or insignificant.

Note: The *World Development Report 1985* presents some later estimates of total contraceptive prevalence rates but with less detail on method mix.

a. Effective methods only.

b. Includes spermicides, foams, and diaphragms.

Source: Westinghouse Social Sciences International Demographic Data for Development.

### **Box 11. Family Planning in Zimbabwe**

More than one-quarter of married women of reproductive age in Zimbabwe are using a modern method of contraception, and over two-thirds of all mothers have knowledge of oral contraceptives, according to recent surveys of contraceptive prevalence. Although the detailed results of the 1982 census are not yet available, it is clear that the fertility rate has declined significantly since the previous census, in 1969.

What are the main reasons for the substantial success which has been achieved in Zimbabwe? In the first place, increasing female education, urbanization, a per capita income (\$740) that is high by African standards, and the high cost of raising a large family have probably increased demand for family planning. Health has also improved; life expectancy at birth is now about 56 years and the infant mortality rate has reportedly fallen to roughly 70 per thousand live births, compared with about 100 per thousand in 1965.

The government has taken steps to build a consensus about the legitimacy of family planning. It has frequently expressed its concern about the damage done by rapid population growth. Population education is provided in secondary schools and colleges, and presentations on family life education are made in primary schools by specially trained youth advisers. Two of Zimbabwe's four radio stations donate time for weekly broadcasts on family planning and population issues. The women's branch of ZANU, the main political party, provides political support and encouragement for family planning.

Most important, the government has maintained and strengthened its programs for delivery of family planning services. The extensive transport and communication network in Zimbabwe has made this job easier. About half of the family planning work is carried out by the Zimbabwe National Family Planning Council, now a parastatal body under the Ministry of Health. The council runs twenty-eight family planning clinics around the country, but the bulk of its services are provided by almost 600 community-based outreach workers (up from about 360 at independence in 1980), over 90 percent of whom are women working mainly in the rural areas. These women, after being selected by their communities, receive four weeks of training and are given a bicycle and contraceptive supplies. They then provide family planning education, motivation, and screening services and supply oral contraceptives and condoms. They supply the first

month's pills, send women for a checkup at a local clinic, and then offer a two-month resupply of pills.

Population in the catchment area of each community-based distributor is at least 5,000 people but may be as high as 20,000. On average, the outreach workers visit households once every month or two. Their volume of work has increased considerably since 1980. The number of new acceptors of family planning in a three-month period (October–December) rose from 3,938 in 1981 to 28,067 in 1982 and to 52,689 in 1983. It is estimated that in 1983 there were 169,000 new acceptors and 1,204,000 revisits.

One reason for the success of this program has been its strong management and supervisory system, with group leaders at the district level responsible for ten to twelve of the outreach workers. In addition, the outreach workers are relatively well paid, earning 135 Zimbabwean dollars (US\$88) each month.

In addition to the council's program, the provision of family planning services is regarded by the government as an essential part of regular government-sponsored maternal and child health care. It is governmental policy for family planning services to be made available through all health facilities and through health outreach workers, of whom Zimbabwe has several thousand. Although some family planning work has been carried out by these workers in the past, the Ministry of Health is taking steps to strengthen their efforts. Family planning has been integrated into the training curricula of state registered nurses, medical assistants, and midwives. Plans are being made to retrain all the present health staff who have not had family planning training before. The storage and supply system for contraceptives is being improved, since problems in these areas have constrained the program in the past, and ways are also being considered to strengthen the family planning programs in urban areas.

This combination of efforts has produced the highest levels of contraceptive practice in Sub-Saharan Africa—27 percent nationally according to recent surveys (39 percent in urban areas and 20 percent in rural areas, not all of which have services)—and the first demonstrable decline in fertility among Sub-Saharan countries. Program managers also believe that the increased practice of family planning has helped considerably to improve maternal and child health.

In Zimbabwe, an estimated increase in contraceptive prevalence from 22 percent in 1982 to 27 percent in 1984 (see Box 11) coincided with intensified and extended outreach efforts. Small outreach programs (varying in coverage from about 40,000 to perhaps 200,000 people) operate in Kenya (the Chogoria program and efforts by Maendeleo and the FPA), Zaire, Sudan, and Nigeria, and in North Africa—in Tunisia and Morocco and in Menoufia in Egypt. Through house-to-house outreach programs developed from pilot projects in Marrakech, the government of Morocco now provides contraceptives and oral rehydration salts, nutrition supplements, and referral for immunization to 15 million people in eleven provinces.

Outreach is effective for several reasons. It is convenient for clients, and it reduces the financial and psychological costs of using family planning. Outreach workers' strong community ties help them build a closer rapport with clients than unfamiliar health professionals may be able to achieve.

Finally, outreach systems encourage communities to get more involved in their own health care.

There is debate on whether outreach is more cost-effective when it provides family planning alone or as part of a broader package of health care. In the Danfa project in Ghana integrated outreach has proved more cost-effective in encouraging family planning. In a project in Tunisia the opposite seems to be the case. In Zaire an urban program that focused on family planning achieved higher contraceptive prevalence than a rural program that mixed health care with family planning, but rural-urban differences obviously played a role and cost data are not yet available (see Box 12).

The package approach has some obvious advantages. It offers greater privacy—a person could be seeking any of several services being offered—and it may be more cost-effective, particularly in rural areas. Its principal disadvantage is that family planning sometimes gets crowded out—in some cases because demands for curative care predomi-

#### **Box 12. Community-Based Family Planning in Zaire**

One of the first community-based distribution programs in francophone Sub-Saharan Africa was undertaken recently in Zaire, in an urban area of about 133,000 and a nearby rural area of 25,000 in fifty-three villages. Although 95 percent of urban and rural women knew at least one traditional method of fertility control (withdrawal, abstinence, rhythm, douche, and folk methods) and 80 percent had heard of at least one modern method (pill, IUD, sterilization, condoms, spermicides, and injectables), only 5 percent were actually using modern methods when the project began. Some 7 percent in rural areas and 10 percent in cities had tried contraceptives.

The urban program focused only on family planning. The rural program combined family planning with delivery of drugs to combat malaria, intestinal parasites, and infections in children under 5 years of age. Four activities were carried out in project areas: group meetings, home visits where contraceptives (and, in rural areas, medicines) could be supplied, provision of existing dispensaries with contraceptives and with medications for children, and establishment of community-based distributors (matrones) in rural areas that lacked dispensaries. Teams of home visitors (ten in urban areas, five in

rural areas) visited all women of reproductive age three times. Intervals between visits were four to six months and visits lasted twenty to forty minutes. In rural areas the home visitor provided child health counseling, demonstrated preparation of oral rehydration solution, and offered to sell limited quantities of oral rehydration salts, chloroquine, aspirin, and mebendazole. The home visitor then discussed family planning and contraception, with husbands encouraged to be present. She could provide a free limited supply of contraceptives—one cycle of pills, one container of foam or vaginal tablets, or one dozen condoms—and could refer clients to clinics for IUDs or female sterilization. Resupply of contraceptives was handled by encouraging women to go to dispensaries or matrones.

Some 29 percent of urban women and 37 percent of rural women visited were ineligible (because of pregnancy, absent husbands, or menopause) to receive contraceptives during the first round. Among those eligible, 52 percent of urban women and 40 percent of rural women accepted contraceptives. By the second round, half of the urban and two-thirds of the rural first-round acceptors were still using contraception.

nate, in others because the traditional orientation of health workers is toward medical interventions. This problem can be reduced if the package concentrates on delivering three or four services only, with referrals for other services. This prevents overloading outreach workers, who often have little or no formal education and only a few weeks of training.

### ***Nongovernmental Programs***

In Africa financial and administrative constraints mean that governments should encourage expansion of the roles of private and community groups, private practitioners, and the commercial sector in the provision of family planning. Parallel private and public services offer clients a greater range of choice in type, quality, cost, and location of services, and competition is likely to encourage improvement of all programs in the long run. Parallel services also free government revenues for more remote areas where nongovernmental programs are more reluctant to go. The growing role of African family planning associations, women's organizations, and commercial distributors in several countries has already been described.

### ***Other Issues***

Logistics, training, and service costs will also determine how rapidly services will expand in the next decade.

**LOGISTICS.** Logistical weaknesses plague most health programs throughout the world, but Africa's limited transport and communications infrastructure, vast and difficult terrain, dispersed populations, and lack of financial resources make this problem especially acute there. Even in Africa's best programs, supplies of pills or condoms are often unavailable in some areas for two or three months a year. Yet long-run acceptance of such contraceptive methods as pills and condoms is strongly related to the reliability of supplies.

Several corrective measures can be taken:

- Improve forecasts of demand. Timely information on how supplies are being used can be supplemented by data from pilot projects, where usage can be monitored more easily and accurately.
- Maintain larger inventories near the clients. The more erratic the supply, the larger should in-

ventories be all along the line, but especially in the hands of the final user.

- Encourage many channels of distribution. Allow contraceptives to be imported and sold by private concerns, FPAs, women's groups, and so on.
- Encourage use of longer-term methods such as injectables, IUDs, and sterilization that are less dependent on continuity of supply.

**TRAINING.** Training of local family planning workers has considerable influence on the impact of programs. Experience in Africa and elsewhere suggests that an effective and affordable approach for basic health workers involves at least a month of basic training in human physiology, pregnancy and childbirth, key health measures, and family planning, combined with in-service training and periodic on-the-job supervision. Several countries have also developed training materials for semiliterate or illiterate workers.

For more highly trained workers (for example, nurses), a strong emphasis on family planning in basic training curricula is essential. This should be supplemented by special courses that emphasize the appropriate use of outreach, the specifics of maternal and child health, and communications skills. Management training for senior and intermediate levels is crucial and should include the basics of management such as the need to set realistic objectives, assign responsibility, and weigh alternative allocations of resources and the use of modern program management systems.

**COST.** Family planning is not only effective; it is also cheap, even when put within reach of entire populations. The best cost data on African family planning programs come primarily from Zimbabwe's national program and from such pilot programs as Chogoria in Kenya. (The figures are not always complete and they cover only a few years.) In Zimbabwe estimates suggest that the annual cost of services is roughly \$20 per user for family planning; in Chogoria the cost is about \$25 for services that include simple health measures. These figures exclude the costs of clinic construction and income from contributions and fees.

Where outreach has been under way for only a few years, contraceptive use often climbs sharply, and costs per active user fall. The cost per active user in Chogoria, Kenya, has been halved in the past three years as use of contraception has be-

come more widespread, even though services are now being extended to more remote, less accessible areas. The \$25 per user cost of the program in Chogoria, where prevalence is about 27 percent, is half the \$50 cost of the national family planning program, where prevalence is about 8 percent.

For the next several decades, the recurrent or operating cost of family planning in Africa is likely to be roughly \$20 a year per active user. This corresponds to a per capita cost for the entire population of about \$0.75 (under the assumption that married women of reproductive age constitute about 15 percent of the population and that the prevalence rate is 25 percent). Actual per capita spending by government sources on family planning ranges from about \$0.25 to \$1.75 in Asia and Latin America and from \$0.25 to \$3.00 in Africa. Public spending on health in Africa is about \$3 to \$15 per capita. Assuming that there is some private spending, total per capita spending of \$0.75 is well within reach.

Over time, per capita cost is likely to follow a U-shaped pattern. In the early stages it may be quite easy to increase the number of contraceptive users, permitting marginal costs to fall, as in Chogoria. But as a program is extended to more clients who are harder to reach, marginal costs rise, and a doubling of spending fails to double the number of clients. If programs add new components such as outreach or sterilization or improve service delivery by better training and longer hours, they may attract enough new users to prevent marginal costs from rising. Outside Africa program improve-

ments have produced declining or at least roughly constant marginal costs, for example, in Indonesia and other major programs. But in Africa two factors will tend to keep costs relatively high for at least the next decade. First, because current knowledge about family planning is poor, programs will need intensive outreach, which is relatively expensive. Second, because African populations are relatively dispersed in rural areas, programs that reach beyond urban areas are likely to experience rising costs per user.

Current total public and private spending on family planning in Africa is probably under \$100 million, (including about \$53 million provided by external sources). What would be the direct financial requirements, at \$20 per active user, of family planning and health programs in Africa over the next several decades? In 2000, under the standard population projection described in Chapter 1, Africa's population would be about 730 million. This total would include about 120 million married women of reproductive age, about 27 percent—32 million—of whom are projected to be practicing contraception. At \$20 a year per active user, the program operating cost would be about \$640 million in 1984 U.S. dollars. By 2030, under the standard projection, Africa's population would be about 1,390 million, including about 226 million married women of reproductive age. The projection assumes that over 70 percent of these women will use contraception, which implies an annual program cost in 1984 U.S. dollars of about \$3,200 million, at least thirty-two times current spending.



## *The Role of the Government*

Chapters 3 and 4 focused on programs to slow population growth and to extend family planning services. These services are the responsibility of several public and private bodies. This chapter draws on points made above to address more directly the question of what role the government should play in developing programs and extending services. In certain activities the government must be the leading actor. In others its major contribution is likely to be in encouraging other potential players.

### **Political Commitment, Policy Leadership, and Consensus Building**

Public discussion of population and family planning issues by national leaders is important not only to mobilize commitment throughout the political and administrative hierarchy but also to ensure social acceptability and support of family planning programs outside the government.

Most governments in Africa now support the goal of lowering fertility, to achieve demographic targets or for health reasons (see Table 22). Only five countries—Chad, Côte d'Ivoire, Gabon, Guinea-Bissau, and Mauritania—which together account for about 2 percent of the total Sub-Saharan population, still take pronatalist positions or show virtually no support for family planning.

In only a few countries, however, has a rhetorical commitment to population policy been matched by firm political and financial support for specific programs, especially for programs in the ministries of agriculture, education, youth, and recreation. As a result, little effort has gone into increasing the demand for family planning, and the existing demand has hardly been tapped.

In an environment in which the idea of family planning is still new, the government must take the lead in encouraging provision of services by the private sector as well as by the government itself. Equally important, the government must take the lead in promoting dissemination of information about family planning and developing a social consensus on its legitimacy. The government must also provide policy leadership on the issues discussed in Chapter 4: program design that is geared to young people and to men, an easing of restrictions on the use of various contraceptive methods, and wider use of innovative outreach and community programs.

### **Data Collection, Information Feedback, and Research**

Nationwide demographic information is a public good that governments need as input to a wide range of political, social, and resource allocation

**Table 22. Population Policy Indicators for Selected Sub-Saharan African Countries, 1984**

Country	FP index 1984 <sup>a</sup>	Policy position 1984 (1)	Demographic data (2)	Institutions			Family planning program				
				(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Benin	n.a.	B	1979, WFS				x				
Botswana	D	A	1981, CPS	x (p)				x			
Burkina	E*	B	1975	x	x	x		x	x	x	
Cameroon	E	B	1976, WFS	x	x						
Côte d'Ivoire	E*	C	1975, WFS			x	x		x		
Ethiopia	E*	B	1984	x (p)			x	x			
Gambia	E*	A	1983				x	x	x	x	
Ghana	E*	A	1984, WFS	x	x	x	x				
Guinea	E	B	1983	x	x						
Kenya	D	A	1979, CPS/WFS	x		x	x	x			
Lesotho	E*	A	1976, WFS	x				x			
Liberia	D	A	1974	x	x	x	x	x	x		
Malawi	E*	B	1977					x			
Nigeria	E*	A	1963, WFS	x	x	x	x				
Rwanda	D	A	1976	x				x			
Senegal	E*	A	1976, WFS	x	x	x	x	x	x		
Sierra Leone	E	B	1974	x	x	x					
Somalia	E*	B	1975, CPS		x (p)						
Sudan	E	B	1983, WFS			x					
Tanzania	D	A	1978			x	x	x			
Uganda	E*	A	1980			x	x				
Zaire	E*	B	1983, CPS				x	x		x	
Zambia	E*	B	1980	x (p)		x	x				
Zimbabwe	C	A	1982, CPS		x (p)	x	x	x	x	x	

n.a. Not available.

Note: (p), proposed.

a. FP index 1984 is based on score of family planning effort developed by Mauldin and Lapham and slightly modified. Thus, E, very weak or none; E\*, very weak but efforts beginning; D, weak; C, moderately strong.

Col. 1. As recorded in public statements such as those for the International Population Conference, August 1984, Mexico City, or as expressed by high officials or in national development plans. A, support for family planning for demographic reasons; B, support for improvement of maternal and/or child health; C, no support.

Col. 2. Date of most recent census. WFS, World Fertility Survey, CPS, Contraceptive Prevalence Survey.

Col. 3. Country has a population planning unit that integrates, or plans to integrate, demographic projections into current economic plans and considers the effects of policies on demographic parameters.

Col. 4. Country has a high-level coordinating body, such as a population commission, to set population policy, oversee or coordinate implementation, and evaluate results of multisectoral policies.

Col. 5. Country has a research institution (governmental, voluntary, or private) which has in the past or currently is engaged in any form of population-related research or training.

Col. 6. Country has governmental financial support of private family planning associations.

Col. 7. Country has public family planning services.

Col. 8. Country has family planning education to promote family planning and small family norms.

Col. 9. Country has publicly subsidized commercial sales of contraceptives.

Col. 10. Country has eliminated all explicit and implicit subsidies that encourage large families, such as tax reductions for each child, family allowances, and free or subsidized health and education services.

Sources: World Bank files; UNFPA Needs Assessments; UNFPA (1982-83); World Bank (1984d); government statements at U.N. International Population Conference, August 1984, Mexico City.

issues. Governments in virtually all countries take the leading role in sponsoring censuses, periodic sample surveys, and vital registration schemes.

Particularly in the early stages of developing population policies and programs, data collection and analysis are vital. Reliable data on population size and growth is critical for generating public commitment to slower growth and for monitoring trends and effects of policies over time. Without accurate information policymakers will be willing to act only slowly and cautiously.

Monitoring of demographic trends is best done through periodic censuses and continuous vital registration. The 1970s saw great progress in census-taking in Africa. All of the countries with a history of decennial censuses (mainly the anglophone countries of East, southern, and West Africa) took their censuses more or less on time. In addition many countries (primarily the francophone countries of the Sahel and western and central Africa) took their first census during the decade. By 1980 only five countries in Sub-

Saharan Africa remained without a modern enumeration, as against nineteen in 1970. This achievement was in large part a result of assistance from the UNFPA, USAID, and individual countries.

The experience and prospects of the 1980s are far less encouraging. Some anglophone countries have failed to hold their latest census on schedule, and many francophone countries are now hesitating over their second census. This situation is largely attributable to the severe economic difficulties faced by most African countries in the 1980s and the drastic reductions in assistance from the traditional external sources for this round of censuses.

An aspect of census-taking that needs special attention is development of processing and analytic capability within the countries. Several countries that conducted censuses in the 1970s either did not process the data at all or experienced long delays in processing. Census offices with adequate, well-trained staff need to be established on a permanent basis in every country for the specific purposes of data processing, analysis, and updating. Such an effort at institution building should be the focus of the upcoming round of censuses.

At present no African country has an effective vital registration system. Because of the inherent problems involved in making improvements it is too much to expect that the system will provide the needed information in the near future. But in a few countries initial efforts to build a foundation are now warranted, at least on an experimental basis.

National sample surveys can not only help fill the data gaps that arise from ineffective vital registration systems but can also provide information which is useful for more specific purposes. For instance, fertility and family planning surveys such as the World Fertility Surveys (WFS) and the Contraceptive Prevalence Surveys (CPS) have led to policy and program changes. At least one such survey has taken place in the past decade in more than a dozen Sub-Saharan African countries, but more than half of the countries have never had one.

African governments must become the main sponsors of research and analysis of work on population issues and problems. Most countries need to assess their baseline demographic position to identify factors that affect current population dynamics. Such diagnosis will help in the selection of culturally appropriate interventions to reduce fertility.

Research findings can guide the design, monitoring, and evaluation of population programs. High priority should be given to research on how to improve service delivery. Of equal importance is support for the evolution and adaptation of contraceptive technology that is suited to rural communities with minimal health infrastructure. Cultural values and attitudes that determine desired family size require sympathetic analysis with the aim of helping families to choose the small-family norm.

Adolescent fertility is a growing concern. Unmarried teenagers have been left out of the large sample surveys of the WFS and the CPS; they need to be included in future analysis. Small-scale ethnographic studies offer a complementary means of identifying effective program interventions for young women who need to delay the start of child-bearing. And given the virtually inevitable rapid growth of the labor force and the school-age population for several decades, the sponsorship of analytical work to ensure sensible planning to cope with rapid population increases will fall largely to governments.

### **Coordinating Governmental and Private Programs**

Often, separate units within such key ministries as planning, health, and education will carry out separate analyses of the population issue and implement their own particular population and family planning programs. Such an arrangement may make it easier to protect specific programs, such as family planning, but if family planning is not the main activity of any unit, it may suffer as a consequence. To ensure a more integrated approach to population questions and strategy, these units can be made to liaise with a coordinating body, an extram ministerial committee, or a separate ministry.

A few African governments have established central policymaking or coordinating bodies. The first priority of such a body is to build a political consensus on what needs to be done. It can also argue for financial support for population policies, allocate it among institutions, provide guidance on program implementation, and assess and adjust the strategy as experience is gained. A coordinating body will be more effective if it has the political and budgetary authority to back its decisions and if it cooperates with private institutions. It must

avoid heavy-handed edicts that may discourage activity by comparatively autonomous ministries or private organizations.

Experience so far shows that these coordinating bodies suffer from several weaknesses:

- Their professional staffs are small and often poorly trained. The National Population Commission in Sierra Leone, for instance, relies on a population planning unit that has only two professionals.

- They often have to operate in an information vacuum, with little information and even less analysis of the problems on which they are supposed to make recommendations and decisions.

- They lack authority or even much influence over programs in ministries that deal with family planning, or in fields that affect public attitudes toward family planning. The National Population Bureau of Nigeria, for example, has no formal ties with the Ministry of Health or its operating programs.

- They lack authority to stipulate spending on family planning in the budgets of various ministries.

### Encouraging Private Suppliers

If family planning programs are to expand steadily, some reorientation in the direction and nature of government involvement is necessary. The commitment of government leaders to the development of population policy must be strengthened, but at the same time governments must deliberately avoid monopolizing the actual provision of family planning services. Heavy government involvement in delivering services is likely to strain limited administrative and financial resources. Governments therefore need to develop a distinctly African approach, probably one that involves a deliberate fostering of pluralism. Initiatives by local governments, communities, and the private sector to extend access to family planning services should be encouraged.

Fostering pluralism, however, means more than merely passively tolerating diversity. It entails facilitating local and private initiatives, making choices about how and where to expend the government's limited technical and administrative resources, and collaborating with private organizations in areas, such as information and training, where collaborative efforts can improve efficiency.

Nor is pluralism a license for government inaction. The government must take the lead in promoting dissemination of information about family planning and developing a consensus on its legitimacy. In rural areas where the government is the major or only provider of modern health care, and especially of maternal and child health care, the public sector will have to be the principal provider of family planning services for some time to come.

### Financing Family Planning Programs

Chapter 4 showed that effective family planning programs in Africa (together with some basic health care) cost roughly \$20 a year per active user—\$0.75 per capita, assuming a 25 percent contraceptive prevalence rate. Estimating the full costs of a population policy is more complicated, since at least some of the programs that strengthen demand for smaller families would be included even though the programs have other objectives—improving women's educational opportunities, for example.

Most costs of family planning programs are recurrent—salaries, transport, maintenance of facilities, and purchase of contraceptives and equipment. The same is true of education and basic health programs that can help reduce desired family size. These costs will have to be sustained for many years. In the short run expansion of such programs will rely on external assistance and on mobilization of nongovernmental community and private sector resources. External assistance will be necessary not only for financing of direct costs but also for technical assistance in program design, training, data collection, and so on. In the longer run governments need to keep a balance between external and domestic financing. Although external assistance has usually been invaluable in getting population programs started, the long-term effectiveness of programs is best served by increasing reliance on domestic finance, including both private and public resources.

Total official population assistance to all developing regions is roughly \$500 million a year, of which over half is from the United States. In recent years population assistance has risen in current dollars but has fallen in real terms. It has dropped from 2 percent of all official development assistance (ODA) in the early 1970s to about 1.5 percent. Population assistance covers about half the

costs of family planning and population programs in all developing countries (excluding China), and it accounts for a much greater fraction in Africa.

In 1981, the latest year for which consistent data on population assistance from all major sources are available, Africa, which has about one-sixth of the developing world's population, received about \$53

million in population assistance, about one-tenth of the total provided. Of this, \$40 million was official aid to governments and the rest was from worldwide programs such as the IPPF and other nongovernmental bodies (see Box 13). This amounts to about \$0.12 per capita a year, as against about \$0.15 received by Latin America, North Africa, and Asia (excluding China). There is

### Box 13. Sources of Population Assistance

The main multilateral source of official aid is the United Nations Fund for Population Activities (UNFPA). Of UNFPA's 1982 annual budget of roughly \$124 million, \$20 million (17 percent) went to programs in African countries. For recipients, UNFPA has several merits. It is flexible in what it will fund (including some recurring costs), and it makes grants rather than loans. It can assist in such population-related fields as primary health care that includes family planning, public information, demography, census-taking, and policy development. It often uses other U.N. bodies, including WHO and UNICEF, to implement the projects it funds, although some governments act as their own executing agencies (and sometimes involve local private organizations).

To support the growing interest in population issues in Africa, over the past two decades UNFPA helped about thirty Sub-Saharan countries to carry out their first censuses. It has also supported demographic surveys and registration systems. Now these "early-stage" activities are winding down, and requests for family planning assistance are increasing. UNFPA's support for maternal and child health and family planning in Africa grew from 19 percent of its assistance in 1981 to 26 percent in 1982. In 1982 alone UNFPA helped nine countries to initiate family health activities. Some twenty-four countries received UNFPA assistance for educational programs on family planning and population. Six countries had population education projects in schools and fourteen others expressed interest in such projects.

Among nongovernmental bodies the leading sources of population assistance are the International Planned Parenthood Federation (IPPF), Family Planning International Assistance (FPIA), the Pathfinder Fund, the Association for Voluntary Sterilization (AVS), and the Population Council. These organizations are flexible in their funding policies, but their resources tend to be limited. As described earlier, IPPF is a worldwide federation of

indigenous private family planning associations (FPAs) in some 116 countries, including 24 in Sub-Saharan Africa. In 1982 African FPAs spent about \$11 million, of which IPPF provided over 80 percent. Some twenty-five countries contributed official population assistance to IPPF.

The FPIA, which is part of the Planned Parenthood Federation of America, works to introduce family planning through such private organizations as churches (for example, in Kenya's Chogoria project), women's groups, and universities; the commercial sector (including the pharmacists' projects in Nigeria and Zambia described in Chapter 4); and governments. Its annual budget in 1982 was about \$16 million (about \$2 million to Africa). It is funded largely by the U.S. Agency for International Development (USAID).

The Pathfinder Fund is largely funded by USAID. In 1982 its budget was about \$7 million. It works primarily with private organizations such as Maendeleo in Kenya to introduce family planning. The Population Council is an international organization that conducts research, provides technical assistance, and sponsors several major publications. Its 1982 budget was about \$15 million.

Among sources of bilateral assistance, the United States has by far the largest program and has been the leading contributor to the UNFPA, the IPPF, and several other private organizations. Its official development assistance for population averages about \$200 million a year. Of that, roughly one-fifth goes to Sub-Saharan Africa, directly or indirectly. About one-sixth of the total goes to the UNFPA, and over half to private organizations such as the IPPF, the FPIA, the Population Council, and universities. The United States is the main foreign donor to Zimbabwe's national program. The Nordic countries, Japan, Germany, and the United Kingdom also provide considerable bilateral population assistance as well as support for the UNFPA, the IPPF, and other private organizations. Several other nations contribute smaller amounts.

a considerable range within each region; countries committed to population programs (such as Bangladesh, Colombia, Egypt, Kenya, the Philippines, and Thailand) receive at least \$0.30 per capita. The low end of the range includes some countries, such as China and India, which have strong family planning programs that are largely self-financed. It also includes others where programs are just starting: Ethiopia and Nigeria currently receive less than \$0.05 per capita a year.

Roughly 30 percent of Africa's receipts were used for collection and analysis of demographic data, compared with 10–12 percent in other regions, and about half for family planning and related health programs, compared with about three-fourths in other regions. These differences reflect the fact that African countries have been at an earlier stage in development of population policy and programs. About 2 percent of population assistance to Africa went for policy development; elsewhere the figure is about 7 percent.

Despite the interest of many external sources of finance in increasing population assistance to Africa, until a few years ago the lack of project opportunities held them back. But African governments and local nongovernmental organizations are now requesting more population assistance. How much more assistance can African countries absorb effectively?

Absorptive capacity depends on institutional capacity (staff and facilities); infrastructure; the capacity of the government or of private organizations to share costs; and, ultimately, client demand. In Africa, with its low levels of income, education, and infrastructure, shortages of trained personnel, and general problems of financing local costs, absorptive capacity has been a constraint on many development programs. Yet some poor

countries have managed to put substantial population assistance to good use. Kenya has recently made real progress in private and government population programs (after years of very limited progress). Outside Africa, among the lower-middle income countries, Indonesia and Thailand have used their considerable population assistance with outstanding effectiveness and have brought family planning to many people in rural areas. Indonesia's per capita income is lower than Zambia's and not much higher than that of Liberia, Lesotho, or Senegal. Neither Indonesia nor the Philippines can match per capita incomes in Cameroon, Congo, or Nigeria.

The existence of an urban population or an educated labor force can increase short-term absorptive capacity. In Cameroon, Congo, Côte d'Ivoire, Ghana, Liberia, Senegal, Zaire, and Zambia, at least one-third of the population lives in urban areas. There are no reliable direct indicators of labor-force education, but about 36 percent of the secondary-school-age population in Ghana, 19 percent in Kenya, and 15–18 percent in Nigeria, Sudan, and Zimbabwe are currently enrolled.

Whether Africa can get the increased population assistance it needs depends not only on the availability of good projects but also on the supply of external aid and the extent to which aid is flexible enough to address the needs. Much will depend on the willingness of aid agencies to assist private organizations as well as governments, to fund research on new methods of contraception and of delivering family planning, and to fund contraceptives, salaries, and other recurring costs as well as capital costs such as construction of clinics. It will also be important for external sources of finance to support basic health care, female education, and other programs to expand women's opportunities.

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## *Population Data Supplement*

The five tables in this supplement provide demographic and policy-related data in addition to those presented in the Statistical Annex, Tables 1 and 19–25. The tables cover the forty-eight countries that make up Sub-Saharan Africa. Countries are listed in ascending order of 1983 per capita income. Within low-income countries (those with a per capita income less than or equal to \$410 in 1982), a distinction is made between low-income semiarid countries and all other low-income countries.

The symbol (.) indicates less than half of 1 percent, and the symbol .. indicates not available. All countries are subject to the same cautions regarding reliability and cross-country comparability that are noted in the Statistical Annex.

### *Table S-1. Population Projections*

The population projections here and in Table 19 of the Statistical Annex were made on the basis of a World Bank computer program that uses a modified cohort-component method to simulate the effects of various fertility, mortality, and migration assumptions on future population size and age structure in successive five-year periods. Births for each period were calculated by applying a schedule of age-specific fertility rates, scaled to agree with

the given total fertility rate, to the female population, classified by age group, for the period. These births enter the population as the youngest cohort; each cohort grows older in accordance with assumed mortality conditions.

The fertility assumptions were entered in the form of total and age-specific fertility rates, and mortality assumptions were entered in the form of expectations of life at birth or of mortality levels based on standardized life tables. Migration assumptions were entered in the form of the number of net migrants in each five-year period by sex and age; the age distribution of migrants was obtained from a model on the basis of their overall sex ratio. Migration assumptions do not vary for alternative fertility scenarios, but for most countries net migration was assumed to reach zero by 2000. The sources of data for base-year population estimates are discussed in the technical note to Table 19 of the Statistical Annex.

For the *standard projection*, the future path for fertility is based on the experience of a group of countries for which a judgment regarding the future year of reaching replacement-level fertility could be made with relative confidence. The assumed year for replacement-level fertility in these countries was regressed on several predictors: the current total fertility rate for each country, the

change in this rate over the previous ten years, the proportion of couples using contraception, and the current female life expectancy. On the basis of this regression, a year for reaching replacement-level fertility was calculated for every country. For each country a curve was mathematically fitted for the course of the total fertility rate between the current year and the year of replacement-level fertility. Fertility is assumed to remain at replacement level once that level has been reached.

The future path for mortality is based on the assumption that increments to life expectancy depend on the level reached. Changes in female life expectancies between 1965–69 and 1975–79 were regressed on the initial life expectancies, separately for two groups of countries: those with female primary school enrollment percentages under 70, and those with percentages of 70 or more (including developed countries). Estimates of one-year increments were obtained by dividing the estimated ten-year increments from these two equations by 10.

Alternative projections build in more rapid and slower fertility decline. For rapid fertility decline, the total fertility rate is assumed to reach replacement level fifteen years before the estimated year in the standard projection. For slower fertility decline, fertility is projected to reach replacement level ten years after the year estimated for the standard projection.

The *rate of natural increase* is the difference between births and deaths per hundred population. Summary measures are weighted by population.

The *total fertility rate* represents the number of children that would be born to a woman if she were to live to the end of her childbearing years and were to bear children at each age at prevailing age-specific fertility rates. The rate for 2000 is given under the assumptions of both standard and rapid fertility decline. Summary measures are weighted by population.

**Table S-2. Population Composition**

The *dependency ratio* is the combined population under 15 and over 64 years of age as a percentage of the population between those ages. The dependency ratio for 2000 is derived from the standard World Bank population projections used in Table S-1.

**Table S-3. Contraceptive Use and Unmet Need**

*Current use of contraception* is expressed as the percentage of currently married women aged 15–49 using each method of contraception. *Sterilization* includes both male and female sterilization. *Vaginal methods* include spermicides and the diaphragm. *Other methods* include rhythm, withdrawal, abstinence, and in some cases douche and folk methods. The sum of prevalence for each method may not add to the total because of rounding.

Low and high estimates of *unmet need* for contraception are calculated only for women who want no more children; they do not include women who wish to delay a birth. The low estimate includes married women of reproductive age who want no more children, are not using any method of contraception, and are exposed to the risk of pregnancy (that is, are fecund, not pregnant, not breastfeeding, or have been breastfeeding for more than a year). The high estimate includes, in addition to the above, those who are using less effective contraceptive methods (rhythm, withdrawal, and the like), as well as those who have been breastfeeding less than one year.

Data for contraceptive prevalence and unmet need are from nationally representative World Fertility Surveys (WFS) and Contraceptive Prevalence Surveys (CPS) for the years specified or from updated World Bank figures.

**Table S-4. Factors That Influence Fertility**

The *mean number of living children* includes children living at the time of the survey. *Desired family size* is based on the response to the question, “If you could choose exactly the number of children to have in your whole life, how many would that be?” Figures are the means for survey respondents who gave numerical answers. Both the number of living children and desired family size generally pertain to all ever-married women aged 15–49, with the exception of Kenya and Sudan (aged 15–50), and Mauritania (aged 12–50). Desired family size figures for Ghana are for currently married women. Living children data for Kenya and Nigeria are for all women of childbearing age.

The *percentage of women aged 15–19 ever married* includes common-law and consensual unions as well as legal marriages.

**Table S-1. Population Projections**

Country	Population (millions) mid-1985	Projected population (millions)						Rate of natural increase, 2000–2005			Total fertility rate 2000–2005		
		Standard projection		Rapid fertility decline		Slow fertility decline		Standard projection	Rapid fertility decline	Slow fertility decline	Standard projection	Rapid fertility decline	Slow fertility decline
		2000	2050	2000	2050	2000	2050						
<b>Low-income semi-arid</b>													
Mali	7.51	11.23	27.91	10.80	21.03	11.39	34.33	2.84	2.21	3.16	5.64	4.40	6.26
Burkina	6.66	9.22	23.21	8.92	17.60	9.34	28.57	2.80	2.31	3.07	5.74	4.75	6.29
Niger	6.47	10.52	29.21	9.85	20.11	10.66	36.59	3.04	2.25	3.34	6.15	4.40	6.76
Somalia	5.38	8.46	22.72	7.60	14.54	8.57	28.22	2.93	2.05	3.22	5.96	4.01	6.54
Gambia, The	0.74	1.09	2.42	1.01	1.76	1.11	2.95	2.32	1.74	2.58	5.32	4.00	5.89
Chad	4.98	7.27	16.61	7.17	13.42	7.35	20.01	2.34	1.92	2.58	5.33	4.44	5.81
<b>Other low-income</b>													
Ethiopia	41.84	63.66	142.04	61.91	113.26	65.14	173.08	2.44	1.93	2.72	4.81	3.78	5.39
Guinea-Bissau	0.89	1.23	2.63	1.18	2.05	1.24	2.97	2.15	1.69	2.34	5.41	4.35	5.81
Zaire	31.56	49.92	116.43	7.34	88.00	51.46	145.59	2.67	1.96	3.05	4.94	3.56	5.73
Malawi	7.04	11.35	28.70	10.27	19.56	11.55	35.23	2.89	2.16	3.21	6.13	4.40	6.84
Uganda	14.86	24.60	64.11	22.09	42.94	25.38	81.51	3.01	2.18	3.35	5.48	3.72	6.24
Burundi	4.70	7.37	18.42	6.85	12.78	7.35	22.37	2.83	1.93	3.20	5.63	3.95	6.26
Tanzania	22.24	36.92	96.44	33.07	64.15	37.99	112.38	3.00	2.16	3.35	5.48	3.71	6.24
Rwanda	6.03	10.24	29.50	8.97	18.19	10.32	37.30	3.20	2.25	3.61	6.38	4.32	7.18
<b>Central African</b>													
Republic	2.58	3.96	9.44	3.89	7.42	4.01	11.45	2.56	2.00	2.85	5.23	4.14	5.79
Benin	4.04	6.47	16.02	5.86	11.09	6.64	19.93	2.80	2.06	3.13	5.14	3.62	5.82
Togo	3.02	4.86	12.11	4.40	8.36	4.99	15.07	2.81	2.07	3.14	5.14	3.61	5.82
Guinea	6.05	8.32	17.68	8.00	13.76	8.40	19.92	2.08	1.62	2.26	5.41	4.35	5.81
Madagascar	10.09	16.19	41.90	15.57	31.14	16.40	51.65	2.92	2.26	3.24	5.60	4.32	6.22
Ghana	13.95	23.14	53.42	20.77	8.15	24.43	69.16	2.77	1.99	3.36	4.33	2.89	5.47
Sierra Leone	3.75	5.36	12.17	5.13	9.21	5.42	13.89	2.30	1.79	2.51	5.84	4.58	6.29
Kenya	20.59	36.46	96.64	32.55	66.20	38.45	128.46	3.27	2.42	3.82	5.19	3.49	6.36
Sudan	21.69	33.39	79.11	31.59	59.11	34.32	98.85	2.64	1.99	2.98	5.20	3.96	5.89
Mozambique	13.87	21.72	53.72	21.95	43.67	22.64	68.75	2.83	2.19	3.13	5.63	3.88	6.25
Namibia	1.16	1.86	4.16	1.65	2.88	1.92	5.19	2.66	1.79	3.10	4.38	2.79	5.22

Africa													
		GDP		Population		GDP per capita		Oil imports		Oil exports		Trade balance	
		GDP	Population	GDP	Population	GDP	Population	Imports	Exports	Imports	Exports	Imports	Exports
<b>Middle-income oil importers</b>													
Senegal	6.56	10.12	23.33	9.18	16.27	10.32	28.83	2.57	1.84	2.90	5.26	3.74	5.95
Lesotho	1.52	2.24	4.93	2.03	3.47	2.28	5.97	2.41	1.68	2.77	4.50	3.13	5.15
Mauritania	1.69	2.57	6.30	2.40	4.49	2.60	7.75	2.74	1.96	3.05	5.64	3.99	6.26
Liberia	2.20	3.46	8.51	3.13	5.78	3.56	10.71	2.70	1.92	3.05	5.42	3.74	6.16
Zambia	6.70	11.04	26.75	9.80	17.98	11.38	33.66	2.86	2.00	3.27	5.10	3.35	5.94
Côte d'Ivoire	10.30	17.31	38.40	15.06	6.26	17.28	45.60	2.45	1.79	2.83	4.53	3.30	5.38
Zimbabwe	8.50	14.28	33.05	12.79	3.61	15.09	42.74	2.73	1.96	3.31	4.34	2.91	5.47
Botswana	1.05	1.76	3.80	1.52	2.69	1.84	4.81	2.49	1.70	3.20	3.67	2.33	4.92
Swaziland	0.76	1.22	2.86	1.12	2.08	1.28	3.67	2.73	2.05	3.19	4.70	3.35	5.63
Mauritius	1.04	1.29	1.82	1.26	1.73	1.30	1.90	1.21	1.13	1.30	2.25	2.12	2.37
<b>Middle-income oil exporters</b>													
Nigeria	99.67	162.72	411.49	146.57	279.65	167.33	519.10	2.92	2.13	3.26	5.42	3.74	6.16
Cameroon	10.19	16.65	41.65	15.67	30.44	17.20	53.19	2.93	2.11	3.36	5.25	3.63	6.14
Congo, People's Rep.	1.91	3.37	7.81	2.95	5.25	3.44	10.01	3.00	1.52	3.61	5.00	2.41	6.13
Gabon	0.83	1.24	2.94	1.22	2.29	1.26	3.56	2.43	1.87	2.71	5.23	4.12	5.79
Angola	8.64	13.22	32.25	12.52	23.50	13.38	39.49	2.66	2.00	2.92	5.75	4.29	6.26
<b>Upper-middle income</b>													
South Africa	33.59	49.44	92.08	45.60	72.75	51.53	112.01	1.96	1.37	2.41	3.24	2.28	4.01
<b>Countries with populations less than 500,000</b>													
São Tomé and Príncipe	0.11	0.16	0.32	0.14	0.23	0.17	0.39	2.23	1.38	2.69	3.69	2.29	4.52
Cape Verde	0.33	0.48	1.03	0.45	0.84	0.49	1.17	2.50	1.98	2.69	3.54	2.71	3.88
Seychelles	0.07	0.08	0.13	0.08	0.11	0.08	0.14	1.43	1.26	1.60	2.39	2.10	2.64
Comoros	0.40	0.66	1.67	0.61	1.17	0.68	2.13	2.98	2.07	3.41	5.25	3.52	6.14
Djibouti	0.36	0.59	1.75	0.55	1.21	0.59	2.04	3.07	2.37	3.31	6.07	4.51	6.57
Equatorial Guinea	0.37	0.54	1.14	0.53	0.92	0.54	1.37	2.18	1.70	2.45	5.24	4.25	5.79
Reunion	0.55	0.69	0.93	0.68	0.90	0.69	0.96	1.11	1.11	1.18	2.12	2.10	2.22
Sub-Saharan Africa	459.02	729.93	1761.64	675.23	1266.33	751.50	2207.46	2.74	2.02	3.11	5.11	3.65	5.86

*Mean duration of breastfeeding* is the number of months a woman would breastfeed, on average, if she followed current practice. It is derived from survey data on current breastfeeding status for all births.

Sources for this table are national censuses, WFS, and CPS for the years specified.

**Table S-5. Status of Women**

The *ratio of adult male to adult female literacy* is the percentage of males aged 15 and over who can read and write divided by the percentage of females aged 15 and over who can read and write. Data are from the *World Development Report 1984*.

The *percentage aged 15–49 ever enrolled in primary school* was estimated by assigning past pri-

mary-school enrollment rates to five-year age groups of the 1980 population aged 15–49 and weighting these rates by the proportion of each five-year age group in the total 1980 population aged 15–49. The source is the *World Development Report 1984*.

The *singulate mean age at marriage* is the mean age at first marriage among people who marry by age 50. It is calculated with the use of data on the proportion ever married in each group of the current population and thus does not reflect the experience of any particular age cohort. The source for this column is the *World Development Report 1984*.

The *economically active population* includes the armed forces and the unemployed but excludes housewives, students, and other inactive groups. Data are from Department of Commerce and USAID publications.

**Table S-2. Population Composition**

Country	Percent of total population												Women aged 15-49 as percentage of total females	
	Dependency ratio (percent)				Population aged 0-14			Population aged 15-64, standard projection		Population 65+, standard projection				
	Standard projection		Rapid fertility decline, 2000		1980	2000	2000	1980	2000	1980	2000	1980		
1970	1985	2000	2000											
<b>Low-income semi-arid</b>														
Mali	89	98	98	91	46.38	46.47	44.34	49.95	50.40	3.67	3.13	44.68	43.96	
Burkina	85	92	97	91	44.15	45.81	43.98	52.28	50.67	3.56	3.52	45.44	43.55	
Niger	93	96	101	88	45.36	47.53	43.97	52.15	49.79	2.49	2.68	45.18	43.62	
Somalia	83	94	98	78	44.18	46.64	40.59	52.90	50.42	2.93	2.94	45.60	44.00	
Gambia, The	82	83	84	71	42.36	42.65	38.23	55.56	54.23	2.08	3.11	47.72	46.25	
Chad	82	78	87	84	40.27	42.72	41.92	56.14	53.60	3.59	3.68	47.51	45.21	
<b>Other low-income</b>														
Ethiopia	90	86	87	79	45.41	43.47	41.05	51.92	53.54	2.67	2.99	45.27	46.16	
Guinea-Bissau	73	87	82	75	43.30	41.54	39.23	52.89	55.07	3.81	3.39	47.25	46.72	
Zaire	89	94	93	83	44.43	44.94	41.94	52.58	51.90	3.00	3.16	45.41	45.04	
Malawi	96	98	96	77	47.09	46.16	40.46	50.34	51.07	2.57	2.77	44.60	44.73	
Uganda	98	103	100	79	47.78	47.29	41.30	49.50	50.10	2.72	2.60	42.97	44.34	
Burundi	81	89	96	82	42.88	45.98	41.93	52.92	51.10	4.20	2.92	46.70	45.01	
Tanzania	98	101	99	79	46.51	47.17	41.03	50.39	50.14	3.11	2.69	43.78	44.07	
Rwanda	99	99	109	83	45.67	49.66	42.56	51.51	47.78	2.82	2.55	44.74	42.74	
Central African Republic	79	80	95	91	43.12	44.44	43.37	54.61	51.42	2.27	4.15	46.55	43.75	
Benin	93	100	97	78	46.47	46.20	40.62	50.29	50.87	3.24	2.93	44.71	45.57	
Togo	88	100	97	79	46.12	46.30	40.70	50.59	50.73	3.29	2.97	44.78	45.51	
Guinea	83	78	82	75	39.59	41.41	39.11	56.92	54.98	3.49	3.61	47.73	46.60	
Madagascar	83	96	98	90	45.47	46.35	44.23	51.15	50.52	3.39	3.12	44.16	44.56	
Ghana	94	107	91	72	47.61	45.09	38.82	49.82	52.29	2.57	2.62	44.41	45.96	
Sierra Leone	77	83	85	77	42.01	42.80	40.27	54.95	54.00	3.04	3.20	46.53	45.85	
Kenya	117	121	103	81	51.02	48.64	42.47	46.08	49.24	2.90	2.13	41.33	44.66	
Sudan	89	92	90	80	44.88	44.41	41.24	52.40	52.58	2.72	3.02	45.49	45.30	
Mozambique	84	90	94	86	44.56	45.62	43.13	52.60	51.46	2.84	2.91	45.44	45.10	
Namibia	87	93	90	68	44.33	44.18	36.98	52.52	52.64	3.15	3.17	45.32	45.87	
<b>Middle-income oil importers</b>														
Senegal	87	92	91	73	43.93	44.35	38.67	52.91	52.44	3.16	3.21	41.91	45.13	
Lesotho	82	86	87	69	40.97	42.38	36.32	54.75	53.42	4.28	4.19	45.70	45.91	
Mauritania	92	88	99	86	43.66	46.26	42.58	53.18	50.26	3.15	3.49	45.07	43.56	
Liberia	87	90	95	77	41.45	45.36	39.51	55.17	51.18	3.39	3.45	46.71	43.97	
Zambia	94	103	96	74	48.37	46.49	39.69	49.28	50.95	2.34	2.57	44.38	45.13	
Côte d'Ivoire	94	90	81	67	45.45	41.86	36.84	52.12	55.29	2.43	2.84	44.42	46.91	
Zimbabwe	97	106	95	75	48.56	46.43	40.17	48.62	51.20	2.82	2.37	43.96	46.46	
Botswana	117	109	94	68	47.31	45.40	36.94	47.55	51.60	5.14	2.99	42.88	46.84	
Swaziland	91	103	90	74	47.11	44.70	39.69	50.13	52.66	2.77	2.64	44.36	46.39	
Mauritius	86	58	52	48	35.11	28.32	26.49	61.13	65.93	3.76	5.75	52.17	55.09	
<b>Middle-income oil exporters</b>														
Nigeria	97	100	97	78	47.39	46.65	40.77	50.16	50.72	2.45	2.63	43.88	44.65	
Cameroon	82	98	100	88	43.63	46.50	43.15	52.34	50.09	4.03	3.40	44.01	43.51	
Congo, People's Rep.	83	97	109	83	45.15	48.47	41.12	51.37	47.96	3.48	3.57	42.99	42.04	
Gabon	64	72	94	91	36.60	43.90	42.78	58.42	56.47	4.97	4.64	48.26	42.80	
Angola	84	89	91	80	44.40	44.61	41.49	52.89	52.49	2.70	2.91	45.68	45.27	
<b>Upper-middle income</b>														
South Africa	85	79	73	60	39.02	38.06	32.85	57.22	57.82	3.76	4.11	48.63	49.06	
<b>Countries with populations less than 500,000</b>														
São Tomé and Príncipe	..	84	81	61	39.17	40.26	32.71	55.07	55.28	5.76	4.47	46.67	46.33	
Cape Verde	..	101	88	78	47.28	42.86	39.89	46.88	53.29	5.85	3.85	42.59	49.89	
Seychelles	..	73	61	52	38.41	31.55	27.55	55.10	62.08	6.49	6.37	43.80	53.04	
Comoros	..	109	101	85	47.32	47.52	42.94	48.33	49.80	4.35	2.68	42.50	43.81	
Djibouti	..	95	99	88	45.41	46.91	43.77	51.92	50.39	2.67	2.71	45.27	43.75	
Equatorial Guinea	..	72	87	84	37.83	42.38	41.42	58.04	53.45	4.13	4.16	48.40	44.54	
Reunion	..	54	49	46	35.05	27.41	26.14	61.14	67.22	3.81	5.37	53.31	55.84	
<b>Sub-Saharan Africa</b>	..	95	93	78	45.41	45.22	40.60	51.67	51.84	2.93	2.94	44.89	45.24	

**Table S-3. Contraceptive Use and Unmet Needs**

Country	Year	Current rate of contraception					Percent who want no more children	Unmet need for contraceptives	
		Sterili- zation	Pills and injectables	IUD	Condom and vaginal methods	Other methods		Low estimate	High estimate
<b>Low-income semi-arid</b>									
Mali	1977	..	..	..	..	..	1	..	..
Burkina	1977	..	..	..	..	..	1	..	..
Niger	1977	..	..	..	..	..	1	..	..
Somalia	1982	..	..	..	..	..	2	..	..
Gambia, The	1977	..	..	..	..	..	5	..	..
Chad	..	..	..	..	..	..	1	..	..
<b>Other low-income</b>									
Ethiopia	1982	..	..	..	..	..	2	..	..
Guinea Bissau	..	..	..	..	..	..	..	..	..
Zaire	1982	..	..	..	..	..	3	..	..
Malawi	1977	..	..	..	..	..	1	..	..
Uganda	1983	..	..	..	..	..	1	..	..
Burundi	1977	..	..	..	..	..	1	..	..
Tanzania	1977	..	..	..	..	..	1	..	..
Rwanda	1982	..	..	..	..	..	1	..	..
Central African Republic	..	..	..	..	..	..	..	..	..
Benin	1981-82	..	..	..	..	..	18	..	..
Togo	..	..	..	..	..	..	..	..	..
Guinea	1977	..	..	..	..	..	1	..	..
Madagascar	..	..	..	..	..	..	..	..	..
Ghana	1979	1	3	(.)	2	4	10	20	5 8
Sierra Leone	1982	..	..	..	..	..	4	..	..
Kenya	1977-78	1	3	1	(.)	2	8	25	6 10
Sudan	1979	(.)	3	(.)	(.)	1	5	27	6 9
Mozambique	..	..	..	..	..	..	..	..	..
<b>Middle-income oil importers</b>									
Senegal	1978	(.)	(.)	(.)	(.)	3	4	..	..
Lesotho	1977	1	1	(.)	(.)	3	5	26	5 9
Mauritania	1981	..	..	..	..	..	1	..	..
Liberia	..	..	..	..	..	..	..	..	..
Zambia	1977	..	..	..	..	..	1	..	..
Côte d'Ivoire	1980-81	(.)	(.)	(.)	(.)	2	3	12	2 3
Zimbabwe	1984	..	..	..	..	..	27	..	..
Botswana	..	..	..	..	..	..	..	..	..
Swaziland	..	..	..	..	..	..	..	..	..
Mauritius	..	..	..	..	..	..	..	..	..
<b>Middle-income oil exporters</b>									
Nigeria	1983	..	..	..	..	..	6	..	..
Cameroon	1978	(.)	(.)	(.)	(.)	2	11	23	1 1
Congo, People's Rep.	..	..	..	..	..	..	..	..	..
Gabon	..	..	..	..	..	..	..	..	..
Angola	..	..	..	..	..	..	..	..	..
<b>Upper-middle income</b>									
South Africa	..	..	..	..	..	..	..	..	..
<b>Countries with populations less than 500,000</b>									
São Tomé and Príncipe	..	..	..	..	..	..	..	..	..
Cape Verde	..	..	..	..	..	..	..	..	..
Seychelles	..	..	..	..	..	..	..	..	..
Comoros	..	..	..	..	..	..	..	..	..
Djibouti	..	..	..	..	..	..	..	..	..
Equatorial Guinea	..	..	..	..	..	..	..	..	..
Reunion	..	..	..	..	..	..	..	..	..

**Table S-4. Factors That Influence Fertility**

Country	Year	Mean number of living children	Desired family size	Percent of women 15–19 ever married	Mean duration of breastfeeding (months)	Total fertility rate among women with		Infertility <sup>a</sup>		
						No schooling	Seven years schooling or more	Year	35–39	40–44
<b>Low-income semi-arid</b>										
Mali	1975 <sup>b</sup>	..	..	54	..	..	..	..	..	..
Burkina	..	..	..	..	..	..	..	..	..	..
Niger	..	..	..	..	..	..	..	..	..	..
Somalia	..	..	..	..	..	..	..	..	..	..
Gambia, The	..	..	..	..	..	..	..	..	..	..
Chad	..	..	..	..	..	..	..	..	..	..
<b>Other low-income</b>										
Ethiopia	1978 <sup>c</sup>	..	..	64	..	..	..	..	..	..
Guinea-Bissau	..	..	..	..	..	..	..	..	..	..
Zaire	..	..	..	..	..	..	..	..	..	..
Malawi	1977 <sup>b</sup>	..	..	51	..	..	..	1977	3.8	3.7
Uganda	..	..	..	..	..	..	..	1969	9.4	11.7
Burundi	..	..	..	..	..	..	..	1970–71	5.1	6.8
Tanzania	..	..	..	..	..	..	..	..	..	..
Rwanda	..	..	..	..	..	..	..	1970	1.6	2.1
Central African Republic	..	..	..	..	..	..	..	..	..	..
Benin	1980–82 <sup>c</sup>	2.5	..	44	19	7.3	4.5	..	..	..
Togo	..	..	..	..	..	..	..	..	..	..
Guinea	..	..	..	..	..	..	..	..	..	..
Madagascar	1975 <sup>b</sup>	..	..	34	..	..	..	..	..	..
Ghana	1979 <sup>c</sup>	..	6.1	31 <sup>d</sup>	18	6.8	5.5	..	..	..
Sierra Leone	..	..	..	..	..	..	..	1974	11.1	13.9
Kenya	1977–78 <sup>c</sup>	3.2	7.2	25	16	8.3	7.3	1977–78	2.0	3.0
Sudan	1979 <sup>c</sup>	3.5	6.3	23	16	6.5	3.4	1979	5.3	6.5
Mozambique	..	..	..	..	..	..	..	1980	14.4	13.7
<b>Middle-income oil importers</b>										
Senegal	1978 <sup>c</sup>	2.9	8.8	59	19	7.5	4.5	..	..	..
Lesotho	1977 <sup>b</sup>	2.6	5.9	32 <sup>d</sup>	20	6.2	4.8	1977	6.0	5.3
Mauritania	1981 <sup>b</sup>	3.1	9.2	39 <sup>d</sup>	16	..	..	1981	4.4	5.8
Liberia	..	..	..	42	..	..	..	1971	12.6	15.8
Zambia	..	..	..	..	..	..	..	..	..	..
Côte d'Ivoire	1980–81 <sup>c</sup>	..	..	56 <sup>d</sup>	17	7.5	5.8	..	..	..
Zimbabwe	..	..	..	..	..	..	..	..	..	..
Botswana	..	..	..	..	..	..	..	1971	6.0	6.1
Swaziland	1976 <sup>b</sup>	3.0	..	..	..	..	..	1976	6.7	6.7
Mauritius	1972 <sup>b</sup>	..	..	13	..	..	..	..	..	..
<b>Middle-income oil exporters</b>										
Nigeria	1982 <sup>c</sup>	2.5	..	44 <sup>d</sup>	18	6.4	5.2	..	..	..
Cameroon	1978 <sup>c</sup>	2.7	..	53	18	4.5	2.5	..	..	..
Congo, People's Rep.	..	..	..	..	..	..	..	..	..	..
Gabon	..	..	..	..	..	..	..	..	..	..
Angola	..	..	..	..	..	..	..	..	..	..
<b>Upper-middle income</b>										
South Africa	..	..	..	..	..	..	..	..	..	..
<b>Countries with population less than 500,000</b>										
São Tomé and Príncipe										
Cape Verde	..	..	..	..	..	..	..	..	..	..
Seychelles	..	..	..	..	..	..	..	..	..	..
Comoros	..	..	..	..	..	..	..	..	..	..
Djibouti	..	..	..	..	..	..	..	..	..	..
Equatorial Guinea	..	..	..	..	..	..	..	..	..	..
Reunion	..	..	..	..	..	..	..	..	..	..

a. Obtained from surveys and censuses of individual countries, where available.

b. Census.

c. Survey.

d. WFS data.

**Table S-5. Status of Women**

Country	Year of recent census	Education variables										Marriage variables						Female/male ratio of percentage aged 10+ economically active (male = 100)		Ratio of female/male life expectancy at birth, 1983 (male = 100)	
		Ratio of adult male to female literacy, 1980 (female = 100)		Secondary school enrollment ratio, 1981		Percentage aged 15-49 ever enrolled in primary school, 1980		Female/male ratio of percentage aged 15-49 enrolled in school (male = 100)		Singulate mean age at marriage, 1977		Minimum legal age at marriage		Polygynists per 100 married men		Age at which 50 percent have ever married		Rural	Urban	Ratio of female/male life expectancy at birth, 1983 (male = 100)	
		Male	Female	Male	Female	Rural	Urban	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Rural	Urban		
<b>Low-income semi-arid</b>																					
Mali	1976	..	..	4	2	15	8	20.6 <sup>b</sup>	54.6	..	..	18	15	22.8 <sup>a</sup>	2.2	27 <sup>b</sup>	17	0.20 <sup>b</sup>	0.13	1.09	
Burkina	1975	..	4	2	15	8	20.6 <sup>b</sup>	54.6	..	..	18	16	..	..	..	..	..	..	1.06 <sup>c</sup>	1.11	1.07
Niger	1977	2.3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0.09 <sup>d</sup>	0.25	1.09
Somalia	1975	3.7	16	6	17	7	..	..	..	..	..	..	None	16	22.03 <sup>e</sup>	2.1	..	..	..	..	1.07
Gambia, The	1983	..	..	..	..	..	..	9.9 <sup>f</sup>	50.7	..	..	None	None	..	..	..	..	..	..	..	1.05
Chad	..	..	..	..	..	..	..	..	..	..	..	..	..	22.0 <sup>g</sup>	2.2	22 <sup>g</sup>	17	0.30 <sup>g</sup>	0.16	1.07	
<b>Other low-income</b>																					
Ethiopia	1984	..	16	8	21	9	..	..	..	..	18-20	12-15	..	..	22 <sup>h</sup>	16	0.35 <sup>i</sup>	0.13	1.08		
Guinea-Bissau	1979	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1.04
Zaire	1974	2.0	..	..	..	..	..	..	8.1	..	..	18	15	29.8 <sup>d</sup>	2.3	23 <sup>h</sup>	18	..	..	0.95 <sup>j,k</sup>	1.06
Malawi	1977	..	6	2	..	..	..	..	42.9 <sup>l</sup>	..	..	..	..	..	..	..	22 <sup>k</sup>	17	0.82 <sup>d</sup>	0.33	1.05
Uganda	1980	..	7	3	..	..	..	..	34.2 <sup>l</sup>	..	..	18	16	..	..	..	20	..	..	..	1.04
Burundi	1979	1.6	4	2	32	14	29.4 <sup>m</sup>	48.4	..	..	..	..	..	..	8.4 <sup>m</sup>	2.1	23 <sup>f</sup>	21	..	..	1.07
Tanzania	1978	1.1	4	2	47	32	35.4 <sup>n</sup>	62.9	..	..	..	18	15	27.1 <sup>l</sup>	2.3	23 <sup>m</sup>	17	0.88 <sup>n</sup>	1.01	1.06	
Rwanda	1978	1.6	3	1	75	49	..	..	..	..	..	..	..	..	8.4 <sup>i</sup>	2.0	20 <sup>h</sup>	20	1.00 <sup>i</sup>	0.87	1.07
<b>Central African Republic</b>																					
Benin	1979	2.4	26	10	50	22	..	39.9 <sup>m</sup>	..	..	None	None	31.1 <sup>h</sup>	2.3	24 <sup>i</sup>	20	0.28 <sup>a</sup>	0.75	1.09		
Togo	1981	..	46	16	85	39	27.9 <sup>i</sup>	57.5	..	18	..	..	35.9 <sup>i</sup>	2.4	25 <sup>h</sup>	18	0.67 <sup>i</sup>	0.65	1.06		
Guinea	1983	..	23	9	44	19	..	..	..	..	18	17	..	..	26 <sup>k</sup>	20	0.94 <sup>o</sup>	0.48	1.03		
Madagascar	1975	..	..	..	..	..	..	..	..	17	14	..	..	..	..	..	..	..	..	1.02	
Ghana	1984	..	44	27	..	..	53.4 <sup>k</sup>	63.6	27	19	13	13	26.2 <sup>p</sup>	2.4	n.a. <sup>m</sup>	19	..	0.78 <sup>i</sup>	1.07		
Sierra Leone	1974	..	..	..	..	..	..	21.2 <sup>l</sup>	..	..	20	15-18	9-18	20.4 <sup>q</sup>	2.1	25 <sup>l</sup>	19	..	0.54 <sup>g</sup>	1.03	
Kenya	1979	1.7	23	15	74	48	..	..	..	20	..	..	..	..	..	..	..	..	..	1.07	
Sudan	1983	..	20	15	42	23	22.5 <sup>f</sup>	62.0	..	21	20	16	..	..	..	25 <sup>f</sup>	18	0.27 <sup>f</sup>	1.01	1.04	
Mozambique	1980	1.9	9	4	..	..	..	..	..	..	..	..	..	..	..	24 <sup>h</sup>	19	..	..	1.07	

Middle-income oil importers																				
Senegal	1976	..	16	8	..	..	..	..	116.9 <sup>i</sup>	25	20	18	16	28.4 <sup>m</sup>	2.2	28 <sup>t</sup>	18	0.42 <sup>i</sup>	0.25	1.07
Lesotho	1976	0.7	13	20	..	..	..	..	..	..	..	..	..	..	..	25 <sup>s</sup>	19	..	..	1.08
Mauritania	1976	..	16	4	19	7	..	..	..	..	..	..	..	..	..	28 <sup>s</sup>	21	0.19 <sup>s</sup>	0.13	1.07
Liberia	1984	..	29	11	58	27	30.9 <sup>k</sup>	53.3	28	19	16	16	..	..	..	26 <sup>s</sup>	18	0.42 <sup>q</sup>	0.22	1.06
Zambia	1980	..	..	..	..	..	..	48.6 <sup>i</sup>	..	..	16	16	..	..	..	24 <sup>t</sup>	18	0.65 <sup>c</sup>	0.32	1.06
Côte d'Ivoire	1975	1.9	25	9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1.06
Zimbabwe	1982	1.3	18	13	..	..	..	..	52.1 <sup>j</sup>	27	18	..	..	..	..	..	..	..	..	1.15
Botswana	1981	..	..	..	..	..	..	..	85.8 <sup>i</sup>	..	..	16	16	..	..	30 <sup>m</sup>	24	..	..	1.06
Swaziland	1976	..	..	..	..	..	..	..	69.0 <sup>i</sup>	..	..	18	16	..	..	..	..	..	0.25 <sup>r</sup>	1.07
Mauritius	1983	1.2	..	..	..	..	..	..	65.6 <sup>l,r</sup>	..	..	18	15	..	..	27 <sup>t</sup>	22	..	..	1.06
Namibia	1981	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1.07
Middle-income oil exporters																				
Nigeria	1973	2.0	..	..	..	..	..	48.0 <sup>b</sup>	68.5	..	..	21	21	..	..	..	..	..	..	1.06
Cameroon	1976	..	25	13	..	..	..	..	..	26	18	..	..	..	..	26 <sup>h</sup>	18	0.70 <sup>b</sup>	0.40	1.06
Congo, People's Rep.	1984	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1.05
Gabon	1980	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1.07
Angola	1983	..	..	..	..	..	..	..	..	..	..	..	..	..	..	23 <sup>h</sup>	18	..	..	1.05
Upper-middle income																				
South Africa	1980	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1.05
Countries with populations less than 500,000																				
São Tomé and Príncipe	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Cape Verde	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Seychelles	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Comoros	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Djibouti	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Equatorial Guinea	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Reunion	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

a. 1960-61.

b. 1976.

c. 1975.

d. 1977.

e. 1959-60.

f. 1973.

g. 1964.

h. 1961.

i. 1970.

j. Refers to total population (urban and rural combined)

aged 15-19.

k. 1955-58.

l. 1969.

m. 1970-71.

n. 1967.

o. 1954-55.

p. 1960.

q. 1974-75. Refers to rural areas only for polygynists.

r. 1972.

s. 1965.

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## *Bibliographical Note*

This report draws on a wide range of World Bank and outside resources. World Bank sources include ongoing economic analysis and research as well as project and sector work on individual countries and studies of development problems in Sub-Saharan Africa, including the recent *Toward Sustained Development in Sub-Saharan Africa* and related background studies. The Staff Working Papers commissioned for the 1984 *World Development Report* and the report itself were important sources. Outside resources include research publications and the unpublished reports of other organizations that are working on population programs and issues in Sub-Saharan Africa. Sources are listed alphabetically in two groups. Background papers commissioned for this report are available from the Population, Health and Nutrition Department of the World Bank as PHN Technical Notes. Most include extensive bibliographies which are not repeated here. The views they express are not necessarily those of the World Bank or of this report. The second list consists of selected World Bank and other sources used in the preparation of this report which may be useful for additional reading. The word "processed" in the bibliography describes works that are reproduced from typescript by mimeograph, xerography, or similar means. Such works may not be cataloged

or commonly available through libraries or may be subject to restricted circulation.

### *Chapter 1. The Demographic Situation*

Population data and the overview of the demography of Sub-Saharan Africa are based primarily on indicators in the *World Development Report 1985* which were prepared under the direction of the Demographic Unit in the Policy and Research Division. The overview also benefited from the work on Africa done by Althea Hill. Demographic projections were prepared as a separate exercise in conjunction with this report and with the preparation of the *World Development Report 1985*. Reports of the World Fertility Survey (WFS) and Contraceptive Prevalence Survey (CPS) were used wherever country reports were available. United Nations (1985b) was used for data prior to 1980. Data on urbanization are from United Nations (1980). Reports of the outcome of the Second Africa Population Conference, available in Economic Commission for Africa (1984b), and of the Second International Population Conference at Mexico City provide details of the policy positions taken by African leaders at these conferences. Box 2, on changing attitudes toward family planning in Swaziland, is based on Bank sector work.

## **Chapter 2. Consequences of Rapid Population Growth**

Background work on the family-level consequences of high fertility includes a comprehensive review of literature on microlevel social and economic consequences by deLancey (1983) and research reports of the detailed household survey of fertility in Botswana, which are presented in Chernichovsky, Lucas, and Mueller (1985). The analysis of the consequences of high fertility for infant, child, and maternal mortality is based on an extensive review of the literature and analysis of World Fertility Survey data for selected African countries by Maine and others (1985). A study of links between high fertility and reproductive health, on the basis of clinic-level data, is available in Janowitz and others (1984). The analysis of the relation between rapid population growth and agricultural production is based in part on Ho (1985) and on other papers prepared for and presented at the joint PHN/Agriculture Symposium in January 1985 (Davis 1985). The recent FAO study (Higgins and others 1982) on land availability and climatic conditions and two studies that analyze the relation between population growth and renewable resources (Barnes 1986; Allen and Barnes 1985) underlie much of the analysis of the links between rapid population growth, land use, and environmental degradation. The problems created by rapid labor force growth for employment creation are examined in depth in Hansen (1984). The analysis of the effects of rapid population growth on government expenditure on health and education is based on information provided by Bank staff.

Box 3, on population growth and carrying capacity of land, draws on Higgins and others (1982) and Ho (1985). Box 4, on savings and capital requirements for rapid population growth, is based on Hansen (1984).

## **Chapter 3. Slowing Population Growth**

The general case for influencing fertility through indirect changes in the environment which influence the proximate and intermediate determinants of fertility is developed in *World Development Report 1984* and in Bulatao (1984). The analysis of the appropriateness of this approach to the determinants of fertility in African settings is based on several background papers prepared for this report

and on selected other sources. Cochrane and Farid (1985) analyze fertility differentials in Sub-Saharan Africa and compare them to those found in other regions. Bongaarts, Frank, and Lesthaeghe (1985) and Lesthaeghe (1984) provide more detailed reviews of available data and analyses of levels and trends in the proximate determinants of fertility. The discussion on the status of women and fertility is based on Faruqe and Gulhati (1983) and on Boserup (1985). Page and Lesthaeghe (1981) is a key reference on childspacing patterns and their links with fertility. Frank (1983) and Belsey (1976) are important sources on levels and trends of infertility and childlessness in Sub-Saharan Africa. The relations between childspacing patterns and infant mortality in Africa and in other regions are analyzed in Hobcraft, McDonald, and Rutstein (1983, 1984) and are examined in more detail for Africa by Maine and others (1985). Data on the incidence of abortion are extremely rare, but evidence of its influence on maternal health is presented in Janowitz and others (1984).

Box 5, on unmet need and family size preferences, draws on the *World Development Report 1984* and on Lightbourne (1985). Box 6, on policies and programs for reducing infant and child mortality, draws on a variety of sources: *Toward Sustained Development in Sub-Saharan Africa* (World Bank 1984c), country reports of the WFS, and personal communications with Bank project staff. Box 7, on fertility and women's status in Kenya, is based on Shepherd (n.d.). Box 8, on women's organizations, is based on the Pathfinder Fund's Maendeleo ya Wanawake project files and on a personal communication with Barbara Herz. Box 9, on building consensus for family planning in Rwanda, draws on Bank sector work.

## **Chapter 4. Expanding Family Planning Services**

Information on the current status and evolution of population and health policy and programs comes partly from World Bank project documentation and sector studies, supplemented by Nortman (1982), reports from the UNFPA (1982-83) inventory, Westinghouse Health Systems (Policy Position Briefs, 1985), and the recent study of family planning program performance by Mauldin and Lapham (1985). The background paper prepared for this report by Ross (1985) synthesizes lessons learned from operations research and pilot proj-

ects in Sub-Saharan Africa. Studies by Maguire (1984) and Bertrand, Mangani, and Mausilu (1984) provide information on the cost-effectiveness of family planning services. Information on Maendeleo ya Wanawake comes from an evaluation sponsored by the Pathfinder Fund and from Maendeleo files. Additional materials for this chapter were derived from annual reports, published documents, and file material made available by USAID, the FPIA, the IPPF, the Pathfinder Fund, the Centers for Disease Control, the Program for International Training and Health (INTRAH) at the University of North Carolina, Chapel Hill, the Population Council, and other organizations that provide family planning assistance in Sub-Saharan Africa. Background work on the demand for family planning and current levels of contraceptive use include, in addition to Cochrane and Farid (1985), work by Frank (1985) and Acsadi and Johnson-Acsadi (1985).

Box 10, on infertility in Sub-Saharan Africa, is from the *World Development Report 1984*. Box 11, on family planning in Zimbabwe, is based on Bank sector work. Box 12, on community-based distribution of family planning, is based on Ross (1985) and Bertrand, Mangani, and Mausilu (1984).

### ***Chapter 5. The Role of the Government***

The assessment of population policy indicators was developed by reviewing Bank project and sector reports, internal strategy statements, and the materials cited for Chapter 4. Bulatao (1985), World Bank project documents, and USAID reports on operations research discuss family planning, costs, actual expenditures, and financing issues. Herz (1984) discusses official development assistance.

Box 13, which discusses sources of population assistance for Sub-Saharan Africa, is based on Herz (1984) and on a personal communication with Herz.

### **Background Papers: PHN Technical Notes**

PHN Technical Notes are available from the Policy and Research Division, Population, Health and Nutrition Department, World Bank.

- Acsadi, G., and G. Johnson-Acsadi. 1985. "Demand for Children and Spacing in Sub-Saharan Africa." PHN/TN 85-6.
- Barnes, D. 1986. "Population Growth and Household Energy in Sub-Saharan Africa." PHN/TN 86-17.
- Bongaarts, J., Odile Frank, and R. Lesthaeghe. 1985. "The Proximate Determinants of Fertility in Sub-Saharan Africa." PHN/TN 85-11.
- Bryan, Paula, and Margot Zimmerman. 1985. "Communication Support for Population Activities in Sub-Saharan Africa." PHN/TN 85-10.
- Caldwell, J., and Pat Caldwell. 1985. "Cultural Forces Tending to Sustain High Fertility in Tropical Africa." PHN/TN 85-16.
- Cochrane, Susan H. 1985. "Development Consequences of Rapid Population Growth: A Review from the Perspective of Sub-Saharan Africa." PHN/TN 85-8.
- Cochrane, Susan, and Samir Farid. 1985. "Fertility in Sub-Saharan Africa: Levels and Their Explanation." PHN/TN 85-13.
- Frank, Odile. 1985. "Demand for Fertility Control in Sub-Saharan Africa." PHN/TN 85-20.
- Ho, Teresa J. 1985. "Population Growth and Agricultural Productivity in Sub-Saharan Africa." PHN/TN 85-19a.
- Maine, Deborah, and others. 1985. "Effects of Fertility Change on Maternal and Child Survival: Prospects for Sub-Saharan Africa." PHN/TN 85-15.
- Robertson, Robert. 1985. "Review of Literature on Costs of Health Services in Developing Countries." PHN/TN 85-21.
- Ross, John A. 1985. "Family Planning Pilot Projects in Africa: Review and Synthesis." PHN/TN 85-7.

### **General References**

- Ainsworth, Martha. 1985. *Family Planning Programs: The Clients' Perspective*. World Bank Staff Working Paper no. 676. Washington, D.C.
- Allen, Julia, and D. Barnes. 1985. "The Causes of Deforestation in Developing Countries." *Annals of the Association of American Geographers*, vol. 75, no. 2.
- Belsey, Mark A. 1976. "The Epidemiology of Infertility: A Review with Particular Reference to sub-Saharan Africa." *World Health Organization Bulletin*, vol. 54, pp. 319-41.
- Bertrand, Jane T., W. E. Bertrand, and Miatudila Malonga. 1983. "The Use of Traditional and Modern Methods of Fertility Control in Kinshasa, Zaire." *Population Studies*, vol. 37, pp. 129-36.

- Bertrand, Jane T., Mlandu Mangani, and Matondo Mausilu. 1984. "The Acceptability of Household Distribution of Contraceptives in Zaire." *International Family Planning Perspectives*, vol. 10, no. 1 (March), pp. 21–25.
- Birdsall, Nancy (ed.). 1985. *The Effects of Family Planning Programs on Fertility in the Developing World*. World Bank Staff Working Paper no. 677. Washington, D.C.
- Bongaarts, John. 1979. "The Fertility Impact of Traditional and Changing Child Spacing Practices in Tropical Africa." Center for Policy Studies, Working Paper no. 42. May. New York: Population Council.
- Bongaarts, John, Odile Frank, and Ron Lesthaeghe. 1984. "The Proximate Determinants of Fertility in Sub-Saharan Africa." *Population and Development Review*, vol. 10, no. 3 (September), pp. 511–37.
- Boserup, E. 1981. *Population and Technical Change*. Chicago: University of Chicago Press.
- \_\_\_\_\_. 1984. "Technical Change and Human Fertility in Developing Countries." In W. Schutjer and C. Shannon Stokes, eds., *Rural Development and Human Fertility*. New York: Macmillan.
- \_\_\_\_\_. 1985. "Economic and Demographic Interrelationships in Sub-Saharan Africa." *Population and Development Review*, vol. 11, no. 3 (September), pp. 383–97.
- Boulier, Bryan L. 1985. *Evaluating Unmet Need for Contraception: Estimates for Thirty-six Developing Countries*. World Bank Staff Working Paper no. 678. Washington, D.C.
- Brown, Lester R. 1985. *State of the World 1985: A Worldwatch Institute Report on Progress Toward a Sustainable Society*. New York: Norton.
- Bulatao, Rodolfo A. 1984. *Reducing Fertility in Developing Countries: A Review of Determinants and Policy Levers*. World Bank Staff Working Paper no. 680. Washington, D.C.
- \_\_\_\_\_. 1985. *Expenditures on Population Programs in Developing Regions: Current Levels and Future Requirements*. World Bank Staff Working Paper no. 679. Washington, D.C.
- Bulatao, Rodolfo A., and Ann Elwan. 1985. *Fertility and Mortality Transition: Patterns, Projections, and Interdependence*. World Bank Staff Working Paper no. 681. Washington, D.C.
- Bulatao, R., and others (eds.). 1983. *Determinants of Fertility in Developing Countries*. Vols. 1 and 2. New York: Academic Press.
- Cain, Mead. 1984. *Women's Status and Fertility in Developing Countries: Son Preference and Economic Security*. World Bank Staff Working Paper no. 682. Washington, D.C.
- Caldwell, John (ed.). 1985. *Population Growth and Socioeconomic Change in West Africa*. New York and London: Columbia University Press.
- Caldwell, J. C., and Pat Caldwell. 1976. "Demographic and Contraceptive Innovators: A Study of Transitional African Society." *Journal of Biosocial Science*, vol. 8, no. 4 (October), pp. 347–66.
- Center for Population and Family Health, and University College Hospital, Ibadan. 1985. "Proceedings: Conference on the Oyo State CED project: Community-Based Delivery of Health and Family Planning Services, Ibadan Nigeria, January 14–16, 1985." Processed.
- Centers for Disease Control. 1983. *Family Planning Methods and Practice in Africa*. Atlanta.
- Chernichovsky, Dov, R. E. B. Lucas, and Eva Mueller. 1985. *The Household Economy of Rural Botswana: An African Case*. World Bank Staff Working Paper no. 715. Washington, D.C.
- Cochrane, Susan H., Joanne Leslie, and D. J. O'Hara. 1982. "Parental Education and Child Health: Intracountry Evidence." *Health Policy and Education*, vol. 2.
- DaVanzo, Julie, Jean-Pierre Habicht, Kenneth Hill, and Samuel Preston. 1985. *Quantitative Studies of Mortality Decline in the Developing World*. World Bank Staff Working Paper no. 683. Washington, D.C.
- Davis, Ted J. (ed.). 1985. *Proceedings of the Fifth Agriculture Sector Symposium: Population and Food*. Washington, D.C.: World Bank.
- deLancey, Virginia. 1983. "Family and Household Level Consequences of Childspacing in Sub-Saharan African." Population, Health, and Nutrition Department, World Bank. Processed.
- Dow, Thomas E., and Linda Werner. 1983. "Prospects for Fertility Decline in Kenya." *Population and Development Review*, vol. 9, no. 1 (March), pp. 77–97.
- Dunlop, David, and Dirk Prevoo. 1985. "An Investigation of the Fiscal Effects of Rapid Population Growth on Human Resource Development in Selected Countries in Sub-Saharan Africa." Population, Health and Nutrition Department, World Bank. Processed.
- Economic Commission for Africa. 1984a. *Africa Population Profile/Profil de la Population Africaine*. Baltimore, Md.: Population Communications Service, Population Information Program, Johns Hopkins University.
- \_\_\_\_\_. 1984b. *Kilimanjaro Plan of Action*. Second

- African Population Conference, Arusha, Tanzania, January 9–13, 1984. Addis Ababa.
- Ewbank, Douglas, Charles Mode, and Gary Pickens. 1984. *Quantifying Fertility Forecasts for Africa*. Philadelphia: Population Studies Center, University of Pennsylvania.
- Faruqee, Rashid, and Ravi Gulhati. 1983. *Rapid Population Growth in Sub-Saharan Africa: Issues and Policies*. World Bank Staff Working Paper no. 559. Washington, D.C.
- Food and Agriculture Organization. 1983. *Fuelwood Supplies in Developing Countries*. FAO Forestry Paper no. 42. Rome.
- Frank, Odile. 1983. "Infertility in Sub-Saharan Africa: Estimates and Implications." *Population and Development Review*, vol. 9, no. 1 (March), pp. 137–44.
- Gendell, Murray. 1985. *Stalls in the Fertility Decline in Costa Rica, Korea, and Sri Lanka*. World Bank Staff Working Paper no. 693. Washington, D.C.
- Goliber, Thomas J. 1985. "Sub-Saharan Africa: Population Pressures on Development." *Population Bulletin*, vol. 40, no. 1 (February).
- Gomes, Melba. 1984. "Family Size and Education Attainment in Kenya." *Population and Development Review*, vol. 10, no. 4 (December), pp. 647–60.
- Gwatkin, Davidson. 1984. *Mortality Reduction, Fertility Decline, and Population Growth: Toward a More Relevant Assessment of Relationships among Them*. World Bank Staff Working Paper no. 686. Washington, D.C.
- Hammer, Jeffrey S. 1985. *Population Growth and Savings in Developing Countries: A Survey*. World Bank Staff Working Paper no. 687. Washington, D.C.
- Hansen, Stein. 1984. "Employment Creation Potentials and Limitation in Sub-Saharan Africa." Population, Health, and Nutrition Department, World Bank. Processed.
- Herz, Barbara. 1984. *Official Development Assistance for Population Activities: A Review*. World Bank Staff Working Paper no. 688. Washington, D.C.
- Higgins, J. M., and others. 1982. *Potential Population Supporting Capacities of Lands in the Developing World*. Rome: Food and Agriculture Organization.
- Hobcraft, John, John McDonald, and Shea O. Rutstein. 1983. "Child Spacing Effects of Infant and Early Childhood Mortality." *Population Index*, vol. 49, no. 4 (Winter).
- . 1984. "Demographic Determinants of Infant and Early Child Mortality: A Comparative Analysis." World Fertility Survey, Technical Note 2370. June. London.
- International Labour Organisation. 1985. *Report of the Informal Inter-Agency Expert Group Meeting on Methodologies for Integrated Population and Development Planning*. Geneva.
- International Planned Parenthood Federation. 1983. *Report on Grant Receiving Associations*. New York.
- Janowitz, Barbara, Jo Ann Lewis, Nadine Burton, and Peter Lamptey. 1984. *Reproductive Health in Africa: Issues and Options*. Research Triangle Park, N.C.: Family Health International.
- Kamarck, Andrew M. 1971. *The Economics of African Development*. New York: Praeger.
- Ladipo, O. A., and others. 1984. "Reproductive Health Attitudes and Practices—Nigeria." Pathpaper no. 11. Chestnut Hill, Mass.: Pathfinder Fund.
- Lesthaeghe, Ron. 1984. *Fertility and Its Proximate Determinants in Sub-Saharan Africa: The Record of the 1960s and 70s*. Interuniversity Programme on Demography Working Paper 1984-2. Brussels: Vrije Universiteit.
- Lewis, Maureen. 1985. *Pricing and Cost Recovery Experience in Family Planning Programs*. World Bank Staff Working Paper no. 684. Washington, D.C.
- Lightbourne, R. 1985. "Individual Preferences and Fertility Behavior." In John Cleland and John Hobcraft, eds., *Reproductive Change in Developing Countries*. New York: Oxford University Press.
- Mabogunje, Akin L., and Oladele Arowolo. 1978. *Social Science Research on Population and Development in Africa South of the Sahara*. Appendix 7. International Review Group on Social Science Research on Population and Development, El Colegio de México, Mexico City.
- McCarthy, F. D., and W. M. Mwangi. 1982. *Kenyan Agriculture: Toward 2000*. Laxenburg, Austria: International Institute for Applied Systems Analysis. May.
- McGreevey, William Paul. 1985. *Economic Aspects of Historical Demographic Change*. World Bank Staff Working Paper no. 686. Washington, D.C.
- McNicoll, Geoffrey. 1984. *Consequences of Rapid Population Growth: An Overview*. World Bank Staff Working Paper No. 691. Washington, D.C.
- Maguire, E. S. 1984. "Family Planning Operations Research: A Decade of Experience." In *Selected Papers of the 1984 Annual Conference of the National Council of International Health*. Interna-

- tional Health and Family Planning: Controversy and Consensus.* Washington, D.C.: nciH; Phoenix, Ariz.: Samaritan Medical Foundation.
- Mahar, Dennis (ed.). 1985. *Rapid Population Growth and Human Carrying Capacity: Two Perspectives.* World Bank Staff Working Paper no. 690. Washington, D.C.
- Mauldin, W. Parker, and Robert Lapham. 1985. "Measuring Family Planning Program Effect in LDCs: 1972 and 1982." In Nancy Birdsall, ed., *The Effects of Family Planning Programs on Fertility in the Developing World.* World Bank Staff Working Paper no. 677. Washington, D.C.
- Merrick, Thomas W. 1985. *Recent Fertility Declines in Brazil, Colombia, and Mexico.* World Bank Staff Working Paper no. 692. Washington, D.C.
- Nortman, Dorothy. 1982. *Population and Family Planning Programs: A Compendium of Data through 1981.* New York: Population Council.
- Page, Hilary J., and Ron Lesthaeghe (eds.). 1981. *Child-spacing in Tropical Africa: Traditions and Change.* London: Academic Press.
- Pingali, Prabhu, and Hans P. Binswanger. 1983. "Population Density, Farming Intensity, Patterns of Labor Use and Mechanization." Research Unit, Agriculture and Rural Development Department, World Bank. September. Processed.
- Repetto, Robert, and Thomas Holmes. 1983. "The Role of Population in Resource Depletion in Developing Countries." *Population and Development Review*, vol. 9, no. 4 (December), pp. 609-32.
- Rodgers, Gerry. 1984. *Poverty and Population: Approaches and Evidence.* Geneva: International Labour Organisation.
- Sai, Frederick T. 1984. "The Population Factor in Africa's Development Dilemma." *Science*, vol. 226 (4676) (November 16), pp. 801-05.
- Sapir, Andre. 1985. *Some Aspects of Population Growth, Trade, and Factor Mobility.* World Bank Staff Working Paper no. 694. Washington, D.C.
- Schutjer, W., and C. Shannon Stokes. 1984. *Rural Development and Human Fertility.* New York: Macmillan.
- Shepherd, Gill. n.d. "Responding to the Contraceptive Needs of Rural People." A Report to OXFAM on Kenya in 1984.
- Short, R. V. 1984. "Breastfeeding." *Scientific American*, vol. 250, no. 4 (April).
- Standing, Guy. 1985. *Population Mobility and Productive Relations: Demographic Links and Policy Evolution.* World Bank Staff Working Paper no. 695. Washington, D.C.
- Stephens, Betsy. 1978. "Program Implications of Discontinuation: The Botswana Family Planning Follow-up Study." Pathpaper no. 3. Chestnut Hill, Mass.: Pathfinder Fund.
- Swamy, Gurushi. 1985. *Population and International Migration.* World Bank Staff Working Paper no. 689. Washington, D.C.
- Tan, Jee-Peng and Michael Haines. 1984. *Schooling and Demand for Children: Historical Perspectives,* World Bank Staff Working Paper no. 697. Washington, D.C.
- Tietze, Christopher. 1983. "Induced Abortion: A World Review." *A Population Council Factbook.* 5th ed. New York: Population Council.
- Trussell, James, and Anne R. Pebley. 1984. *The Potential Impact of Changes in Fertility on Infant, Child, and Maternal Mortality.* World Bank Staff Working Paper no. 698. Washington, D.C.
- United Nations. 1980. *Patterns of Urban and Rural Population Growth.* Population Studies no. 68. Department of International Economic and Social Affairs. New York.
- \_\_\_\_\_. 1985a. *Estimates and Projections of Urban, Rural and City Populations.* Department of International Economic and Social Affairs. New York.
- \_\_\_\_\_. 1985b. *World Population Prospects: Estimates and Projections as Assessed in 1982.* Population Studies no. 86. Department of International Economic and Social Affairs. New York.
- United Nations Fund for Population Activities. 1982-83. *Inventory of Population Projects in Developing Countries around the World.* New York.
- \_\_\_\_\_. 1984. "Population Perspectives: Statements by World Leaders." June.
- \_\_\_\_\_. 1985. "Research Requirements for Integrating Population Factors into Development Planning." Expert Group Meeting on Population and Development, New York, January 22-24, 1985. New York.
- University of Ghana Medical School, and UCLA School of Health. 1979. "The DANFA Comprehensive Rural Health and Family Planning Project, Ghana Final Report." Accra, Ghana, and Los Angeles, California.
- Vaughn, Patrick, and Gill Walt. 1984. "Implementing Primary Health Care: Some Problems of Creating National Programs." *Tropical Doctor*, vol. 14, pp. 108-13.
- Ware, Helen. 1976. "Motivations for the Use of Birth Control: Evidence from West Africa." *Demography*, vol. 13, no. 4 (November), pp. 479-93.
- \_\_\_\_\_. 1979. *Population and Development in Africa South of the Sahara. A Review of the Literature.*

- ture, 1970–78.* Appendix 7A. International Review Group on Social Science Research on Population and Development, El Colegio de México, Mexico City.
- Warwick, Donald P. 1982. *Bitter Pills: Population Policies and Their Implementation in Eight Developing Countries*. London: Cambridge University Press.
- Weiss, Eugene M. 1982. "The Calabar Rural Maternal and Child Health/Family Planning Project: The Evaluation and Research Component." International Programs, Working Paper No. 16. March. New York: Population Council.
- World Bank. 1983. *The Energy Transition in Developing Countries*. Washington, D.C.
- \_\_\_\_\_. 1984a. "Institutional Development in Africa: A Review of World Bank Project Experience." Vols. 1 and 3. Report No. 5085. Washington, D.C.
- \_\_\_\_\_. 1984b. "Tenth Annual Review of Project Performance Audit Results." Vols. 1–3. Report No. 5248. Washington, D.C.
- \_\_\_\_\_. 1984c. *Toward Sustained Development in Sub-Saharan Africa: A Joint Program of Action*. Washington, D.C.
- \_\_\_\_\_. 1984d. *World Development Report 1984*. New York: Oxford University Press.
- \_\_\_\_\_. 1985a. *Desertification in the Sahelian and Sudanian Zones of West Africa*. Washington, D.C.
- \_\_\_\_\_. 1985b. *World Development Report 1985*. New York: Oxford University Press.
- Zachariah, K. C. 1984. *The Anomaly of the Fertility Decline in India's Kerala State: A Field Investigation*. World Bank Staff Working Paper no. 700. Washington, D.C.
- \_\_\_\_\_. 1985a. "Fertility, School Age Population and Enrollment Ratios." Population, Health and Nutrition Department, World Bank. Processed.
- \_\_\_\_\_. 1985b. "Long-term Projections of Agricultural Laborforce in Sub-Saharan African Countries." Population, Health and Nutrition Department, Processed. World Bank.
- Zachariah, K. C., and Sulekha Patel. 1984. *Determinants of Fertility Decline in India: An Analysis*. World Bank Staff Working Paper no. 699. Washington, D.C.

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## *Introduction*

The statistical annex provides information on demographic variables in Sub-Saharan Africa. Within low-income countries (defined as those with a per capita income less than or equal to \$410 in 1982), a distinction is made between low-income semiarid countries and all other low-income countries. For middle-income countries (defined as those with a per capita income exceeding \$410), a distinction is made between oil importers and oil exporters. (There are no low-income oil exporters.) Worldwide averages or median values for low-income, lower-middle-income, and upper-middle-income countries are usually included for comparison (see Box 14).

The country tables include all forty-eight countries of Sub-Saharan Africa. Countries are listed by economy in ascending order of GNP per capita except for Angola, Mozambique, and Namibia, for which no GNP per capita can be calculated. Also, countries with populations of less than 500,000 are listed at the bottom of the table in ascending order of GNP per capita. The reference numbers below reflect the order of the tables.

<i>Angola</i>	40	Cameroon	37
Benin	17	Cape Verde	43
Botswana	33	Central African	
Burkina	2	Republic	15
Burundi	12	Chad	6

Comoros	45	<i>Mozambique</i>	24
Congo, Peoples Republic of the	38	<i>Namibia</i>	35
Côte d'Ivoire	30	Niger	3
Djibouti	46	Nigeria	36
Equatorial Guinea	47	Reunion	48
Ethiopia	7	Rwanda	14
Gabon	39	São Tomé and Principe	42
Gambia, The	5	Senegal	25
Ghana	19	Seychelles	44
Guinea	18	Sierra Leone	21
Guinea-Bissau	9	Somalia	4
Kenya	22	South Africa	41
Lesotho	26	Sudan	23
Liberia	27	Swaziland	32
Madagascar	20	Tanzania	13
Malawi	10	Togo	16
Mali	1	Uganda	11
Mauritania	28	Zaire	8
Mauritius	34	Zambia	29
		Zimbabwe	31

Summary measures—totals, median values, or weighted averages—were calculated for the economy groups only if data were adequate and meaningful statistics could be obtained.

The weights used in computing the summary measures are described in the technical notes. The letter *w* after a summary measure indicates that it

**Box 14. Countries, by Economy, Worldwide**

<i>Low-income</i>		
Afghanistan	Guinea	Niger
Bangladesh	Haiti	Pakistan
Benin	India	Rwanda
Bhutan	Kampuchea, Demo- cratic	Sierra Leone
Burkina	Kenya	Somalia
Burma	Lao People's Demo- cratic Republic	Sri Lanka
Burundi	Madagascar	Tanzania
Central African Re- public	Malawi	Togo
Chad	Mali	Uganda
China	Mozambique	Viet Nam
Ethiopia	Nepal	Zaire
Ghana		
<i>Lower-middle-income</i>		
Angola	Indonesia	Paraguay
Bolivia	Jamaica	Peru
Cameroon	Korea, Democratic Republic of	Philippines
Colombia	Lebanon	Senegal
Congo, People's Republic of the	Lesotho	Sudan
Costa Rica	Liberia	Thailand
Côte d'Ivoire	Mauritania	Tunisia
Cuba	Mongolia	Turkey
Dominican Republic	Morocco	Yemen Arab Republic
Ecuador	Nicaragua	Yemen, People's Demo- cratic Republic of
Egypt, Arab Republic of	Nigeria	Zambia
El Salvador	Papua New Guinea	Zimbabwe
Guatemala		
Honduras		
<i>Upper-middle-income</i>		
Algeria	Iraq	Singapore
Argentina	Israel	South Africa
Brazil	Jordan	Syrian Arab Republic
Chile	Korea, Republic of	Trinidad and Tobago
Greece	Malaysia	Uruguay
Hong Kong	Mexico	Venezuela
Iran, Islamic Republic of	Panama	Yugoslavia
	Portugal	

is a weighted average; the letter *m*, that it is a median value; the letter *t*, that it is a total. The median is the middle value of a data set arranged in order of magnitude. Because the coverage of economies is not uniform for all indicators, and because the variation around central tendencies can be large, readers should be cautious in comparing the summary measures for different indicators, groups, or periods. The following conventions apply: .. not available; (.) less than half the unit shown.

Every effort has been made to standardize concepts, definitions, coverage, timing, and other characteristics of the basic data to ensure the greatest possible degree of comparability. Nevertheless, care must be taken in interpreting the indicators. Although the statistics are drawn from sources

that are generally considered the most authoritative and reliable, many of them are subject to considerable margins of error. Because of variations in national statistical practices, most data are not strictly comparable. In addition, the quality of statistics is weaker in Africa than in most other parts of the world, and many of the statistics presented here are very approximate. The data should be construed only as indicating trends and characterizing major differences among economies.

The technical notes that follow the tables outline concepts, definitions, and specific data problems. Readers are urged to refer to the technical notes when using the data. The bibliography gives details of the data sources, which contain comprehensive definitions and descriptions of concepts used.

**Table 1. Basic Indicators**

Country	GNP per capita <sup>a</sup>						
	Population (millions) mid-1983	Area (thousands of square kilometers)	Dollars 1983	Average annual growth rate (percent) 1965-83 <sup>b</sup>	Average annual rate of inflation <sup>a</sup> (percent)		Life expectancy at birth (years) 1983
				1965-73	1973-83 <sup>c</sup>		
Low-income economies	247.0t	15,498t	220w	0.1w	3.7w	18.9w	49w
Low-income semi-arid	30.4t	4,714t	170w	0.2w	4.3w	11.8w	45w
1 Mali	7.2	1,240	160	1.2	7.6	10.3	45
2 Burkina	6.5	274	180	1.4	2.6	10.8	44
3 Niger	6.1	1,267	240	-1.2	4.0	11.8	45
4 Somalia	5.1	638	250	-0.8*	3.8	20.1	45
5 Gambia, The	0.7	11	290	1.4	3.0	10.4	36
6 Chad	4.8	1,284	..	..	4.5	8.3*	43
Other low-income	216.6t	10,784t	230w	0.1w	3.8w	19.6w	49w
7 Ethiopia	40.9	1,222	120	0.5	1.8	4.4	47
8 Zaire	29.7	2,345	170	-1.3	18.7	48.2	51
9 Guinea-Bissau	0.9	36	180	..	..	6.9	38
10 Malawi	6.6	118	210	2.2	4.5	9.8	44
11 Uganda	13.9	236	220	-4.4*	5.6	62.7*	49
12 Burundi	4.5	28	240	2.1	2.9	12.4	47
13 Tanzania	20.8	945	240	0.9	3.2	11.5	51
14 Rwanda	5.7	26	270	2.3	7.7	11.2	47
15 Central African Rep.	2.5	623	280	0.1	3.0	14.4	48
16 Togo	2.8	57	280	1.1	3.1	8.3	49
17 Benin	3.8	113	290	1.0	3.6	10.8	48
18 Guinea	5.8	246	300	1.1	3.0	4.0	37
19 Ghana	12.8	239	310	-2.1	8.1	51.6	59
20 Madagascar	9.5	587	310	-1.2	4.1	13.9	49
21 Sierra Leone	3.6	72	330	1.1	1.9	14.7	38
22 Kenya	18.9	583	340	2.3	2.3	10.8	57
23 Sudan	20.8	2,506	400	1.3	7.2	18.0	48
24 Mozambique	13.1	802	..	..	..	..	46
Middle-income oil importers	38.8t	4,277t	610w	1.0w	3.6w	10.0w	52w
25 Senegal	6.2	196	440	-0.5	3.0	8.9	46
26 Lesotho	1.5	30	460	6.3	4.4	11.9	53
27 Liberia	2.1	111	480	0.8	1.5	7.2	49
28 Mauritania	1.6	1,031	480	0.3	3.9	7.8	46
29 Zambia	6.3	753	580	-1.3	5.2	10.3	51
30 Côte d'Ivoire	9.5	322	710	1.0	4.1	11.9	52
31 Zimbabwe	7.9	391	740	1.5	3.0	9.7	56
32 Swaziland	0.7	17	870	2.6	4.3	14.1	55
33 Botswana	1.0	600	920	8.5	4.4	9.8	61
34 Mauritius	1.0	2	1,160	2.8	5.6	13.1	67
35 Namibia	1.0	824	..	..	..	..	61
Middle-income oil exporters	113.9t	3,256t	800w	3.2w	8.3w	13.4w	49w
36 Nigeria	93.6	924	770	3.2	10.3	13.3	49
37 Cameroon	9.6	475	820	2.7	5.8	12.6	54
38 Congo, People's Rep.	1.8	342	1,230	3.5	4.6	12.4	63
39 Gabon	0.7	268	3,950	3.2	5.8	18.5	50
40 Angola	8.2	1,247	..	..	..	..	43
Upper-middle-income	31.5t	1,221t	2,490w	1.6w	5.8w	13.3w	64w
41 South Africa	31.5	1,221	2,490	1.6	5.8	13.3	64
Countries with populations less than 500,000	2.2t	60t	..	0.2w	..	..	56w
42 São Tomé and Principe	0.1	1	310	-1.3*	..	8.8	65
43 Cape Verde	0.3	4	320	..	..	11.9	64
44 Seychelles	0.1	(.)	2,400	3.4	..	..	70
45 Comoros	0.4	2	..	-0.6*	..	..	48
46 Djibouti	0.4	22	..	-3.6*	..	..	50
47 Equatorial Guinea	0.4	28	..	..	..	..	44
48 Réunion	0.5	3	..	3.4	..	..	67
Sub-Saharan Africa	433.4t	24,312t	560w	1.3w	4.8w	13.5w	50w

Note: For data comparability and coverage see the technical notes.

a. See technical notes.

b. Because data for the entire period are not always available, figures with an asterisk are for periods other than that specified.

c. Figures with an asterisk are for 1973-82, not 1973-83.

Table 19. Population Growth and Projections

Country	Average annual growth of population (percent)			Population (millions)			Hypothetical size of stationary population (millions)	Assumed year of reaching net reproduction rate of 1	Population momentum 1985
	1965-73	1973-83	1980-2000	1983	1990 <sup>a</sup>	2000 <sup>a</sup>			
<b>Low-income economies</b>	<b>2.6w</b>	<b>2.8w</b>	<b>3.1w</b>	<b>243t</b>	<b>305t</b>	<b>411t</b>			
<b>Low-income semi-arid</b>	<b>2.5w</b>	<b>2.5w</b>	<b>2.7w</b>	<b>30t</b>	<b>36t</b>	<b>48t</b>			
1 Mali	2.6	2.5	2.5	7	9	11	37	2035	1.9
2 Burkina	2.0	1.9	2.0	6	7	9	32	2040	1.8
3 Niger	2.6	3.0	3.2	6	8	11	40	2040	2.0
4 Somalia	3.5	2.8	3.0	5	6	8	31	2040	1.9
5 Gambia, The	3.0	3.6	2.7	1	1	1	3	..	1.9
6 Chad	1.8	2.1	2.4	5	6	7	22	2040	1.8
<b>Other low-income</b>	<b>2.6w</b>	<b>2.9w</b>	<b>3.1w</b>	<b>218t</b>	<b>269t</b>	<b>363t</b>			
7 Ethiopia	2.6	2.7	2.6	41	48	64	181	2035	1.9
8 Zaire	2.1	2.5	3.1	30	37	50	145	2030	1.9
9 Guinea-Bissau	1.2	4.3	2.1	1	1	1	4	..	1.8
10 Malawi	2.8	3.0	3.1	7	8	11	38	2040	2.0
11 Uganda	3.4	2.8	3.3	14	18	25	83	2035	2.0
12 Burundi	1.4	2.2	2.9	4	5	7	24	2035	1.9
13 Tanzania	3.1	3.3	3.4	21	27	37	125	2035	2.0
14 Rwanda	3.1	3.4	3.4	6	7	10	40	2040	2.0
15 Central African Rep.	1.6	2.3	2.7	2	3	4	12	2035	1.9
16 Togo	2.8	2.6	3.2	3	4	5	16	2035	2.0
17 Benin	2.6	2.8	3.1	4	5	6	21	2035	2.0
18 Guinea	1.8	2.0	2.1	6	7	8	25	2045	1.8
19 Ghana	2.2	3.1	3.5	13	17	23	64	2025	2.0
20 Madagascar	2.4	2.6	3.1	9	12	16	55	2035	1.9
21 Sierra Leone	1.7	2.1	2.3	4	4	5	17	2045	1.8
22 Kenya	3.7	4.0	3.9	19	25	36	120	2030	2.1
23 Sudan	2.6	3.2	2.8	21	25	33	102	2035	1.9
24 Mozambique	2.3	2.6	2.9	13	16	22	70	2035	2.0
<b>Middle-income oil importers</b>	<b>3.1w</b>	<b>3.3w</b>	<b>3.4w</b>	<b>39t</b>	<b>49t</b>	<b>67t</b>			
25 Senegal	2.4	2.8	2.9	6	8	10	30	2035	1.9
26 Lesotho	2.1	2.5	2.6	1	2	2	6	2030	1.8
27 Liberia	2.8	3.3	3.1	2	3	3	11	2035	1.9
28 Mauritania	2.3	2.2	2.6	2	2	3	8	2035	1.8
29 Zambia	3.0	3.2	3.3	6	8	11	33	2030	2.0
30 Côte d'Ivoire	4.6	4.6	3.6	9	13	17	47	2030	2.0
31 Zimbabwe	3.4	3.2	3.6	8	10	14	39	2025	2.1
32 Swaziland	3.1	3.4	3.3	1	1	1	5	..	2.0
33 Botswana	3.0	4.5	3.5	1	1	2	6	..	1.9
34 Mauritius	2.0	1.4	1.6	1	1	1	2	..	1.8
35 Namibia	2.5	2.8	3.3	1	1	2	6	..	1.9
<b>Middle-income oil exporters</b>	<b>2.5w</b>	<b>2.7w</b>	<b>3.3w</b>	<b>114t</b>	<b>144t</b>	<b>197t</b>			
36 Nigeria	2.5	2.7	3.3	94	118	163	532	2035	2.0
37 Cameroon	2.4	3.1	3.2	10	12	17	52	2030	1.9
38 Congo, People's Rep.	2.6	3.1	3.7	2	2	3	9	2020	1.9
39 Gabon	0.2	1.4	2.6	1	1	1	3	..	1.7
40 Angola	2.2	2.6	2.8	8	10	13	44	2040	1.9
<b>Upper-middle-income</b>	<b>2.6w</b>	<b>2.4w</b>	<b>2.7w</b>	<b>32t</b>	<b>39t</b>	<b>49t</b>			
41 South Africa	2.6	2.4	2.7	32	39t	49	104	2020	1.8
<b>Countries with populations less than 500,000</b>	<b>2.3w</b>	<b>2.5w</b>	<b>2.7w</b>	<b>3t</b>	<b>3t</b>	<b>5t</b>			
42 São Tome and Principe	2.1	2.1	3.1	0.1	0.1	0.2	..	..	..
43 Cape Verde	2.1	1.5	2.4	0.3	0.4	0.5	..	..	1.9
44 Seychelles	3.3	1.3	1.6	0.1	0.1	0.1	..	..	..
45 Comoros	2.3	2.5	3.5	0.4	0.5	0.7	..	..	1.9
46 Djibouti	3.6	7.1	3.1	0.4	0.4	0.6	..	..	..
47 Equatorial Guinea	1.7	1.7	2.3	0.4	0.4	0.5	2	..	1.8
48 Réunion	2.2	1.1	1.6	0.5	0.6	0.7	1	..	1.8
<b>Sub-Saharan Africa</b>	<b>2.6w</b>	<b>2.9w</b>	<b>3.1w</b>	<b>436t</b>	<b>539t</b>	<b>729t</b>			

Note: For data comparability and coverage see the technical notes.

a. For the assumptions used in the projections see the technical notes.

**Table 20. Demographic and Fertility-Related Indicators**

Country	Crude birth rate per thousand population		Crude death rate per thousand population		Percentage change in		Total fertility rate		Percentage of married women of childbearing age using contraception*	
	1965	1983	1965	1983	Crude birth rate 1965-83	Crude death rate 1965-83	1983	2000	1970	1982
Low-income economies	48w	47w	22w	18w	0.3w	19.7w	6.6w	5.6w		
Low-income semi-arid	47w	48w	26w	21w	2.4w	-20.2w	6.5w	6.0w		
1 Mali	50	48	27	21	-4.6	-22.2	6.5	5.9	..	1
2 Burkina	46	47	24	21	3.3	-12.5	6.5	6.0	..	1
3 Niger	48	52	25	20	7.3	-22.4	7.0	6.4	..	1
4 Somalia	50	50	28	20	-0.4	-27.0	6.8	6.2	..	1
5 Gambia, The	47	49	28	23	..	..	6.5	6.2	..	5
6 Chad	40	42	26	21	5.2	-19.2	5.5	5.6	..	1
Other low-income	48w	47w	22w	17w	-0.3w	-19.6w	6.6w	5.5w		
7 Ethiopia	44	41	19	20	-6.9	6.8	5.5	5.1	..	2
8 Zaire	48	46	23	16	-4.0	-32.6	6.3	5.3	..	3
9 Guinea-Bissau	46	47	30	27	..	..	6.0	6.2	..	..
10 Malawi	56	54	29	23	-3.6	-20.1	7.6	6.4	..	1
11 Uganda	49	50	19	17	2.2	-12.4	7.0	5.8	..	1
12 Burundi	47	47	24	19	1.1	-22.6	6.5	5.9	..	1
13 Tanzania	49	50	22	16	2.5	-27.3	7.0	5.8	..	1
14 Rwanda	52	52	17	19	0.8	11.8	8.0	6.7	..	1
15 Central African Rep.	43	41	24	17	-4.7	-31.7	5.5	5.5	..	..
16 Togo	50	49	23	18	-1.2	-20.4	6.5	5.4	..	..
17 Benin	49	49	25	18	0.4	-26.8	6.5	5.4	..	18
18 Guinea	46	47	30	27	2.2	-9.8	6.0	5.6	..	1
19 Ghana	50	49	16	10	-1.8	-35.9	7.0	4.8	..	10
20 Madagascar	44	47	21	18	6.9	-17.0	6.5	5.9	..	..
21 Sierra Leone	48	49	33	27	2.3	-19.2	6.5	6.1	..	4
22 Kenya	51	55	17	12	7.3	-29.4	8.0	5.7	6	8
23 Sudan	47	46	24	17	-2.1	-27.2	6.6	5.5	..	5
24 Mozambique	49	46	27	19	-6.1	-29.6	6.5	5.9	..	1
Middle-income oil importers	48w	47w	19w	15w	-3.5w	-22.9w	6.5w	5.2w		
25 Senegal	47	46	23	19	1.7	-19.2	6.6	5.6	..	4
26 Lesotho	42	42	18	15	(.)	-17.0	5.8	4.8	..	5
27 Liberia	46	49	22	18	6.1	-18.2	6.9	5.7	..	..
28 Mauritania	44	43	25	19	-3.0	-26.2	6.0	5.9	..	1
29 Zambia	49	50	20	16	1.7	-21.4	6.7	5.5	..	1
30 Côte d'Ivoire	44	46	22	14	5.1	-34.9	6.6	4.9	..	3
31 Zimbabwe	55	53	14	13	-4.4	-9.3	7.0	4.8	..	22
32 Swaziland	50	51	21	14	..	..	7.0	6.5	..	..
33 Botswana	53	44	12	9	..	..	6.5	5.9	..	..
34 Mauritius	37	25	8	7	..	..	2.8	2.3	..	51
35 Namibia	45	45	16	11	..	..	6.0	5.5	..	..
Middle-income oil exporters	50w	49w	23w	17w	4.6w	-26.8w	6.8w	5.7w		
36 Nigeria	51	50	23	17	-3.5	-26.8	6.9	5.7	..	6
37 Cameroon	40	46	20	15	16.3	-25.0	6.5	5.6	..	11
38 Congo, People's Rep.	41	43	14	8	5.6	-43.9	6.0	5.5	..	..
39 Gabon	32	35	22	17	..	..	4.5	5.7	..	..
40 Angola	49	49	29	22	-1.6	-25.3	6.5	6.0	..	..
Upper-middle-income	40w	40w	13w	9w	(.)w	-30.8w	5.1w	3.5w		
41 South Africa	40	40	13	9	(.)	-30.8	5.1	3.5	..	..
Countries with populations less than 500,000	42w	38w	18w	13w	-11.8w	-23.2w	3.5w	4.6w		
42 São Tomé and Principe	..	39	..	10	..	..	..	4.8	..	2
43 Cape Verde	41	38	11	10	-7.3	-9.1	5.8	2.9	..	..
44 Seychelles	..	26	..	7	..	..	..	2.6	..	..
45 Comoros	48	49	18	15	2.1	-16.7	7.0	5.8	..	3
46 Djibouti	..	49	..	18	..	..	..	6.5	..	..
47 Equatorial Guinea	40	39	30	21	-2.5	-30.0	5.0	5.7	..	..
48 Reunion	40	23	10	7	-42.5	-30.0	2.5	2.2	..	..
Sub-Saharan Africa	48w	47w	22w	17w	-1.2w	-21.6w	6.5w	5.4w		

Note: For data comparability and coverage see the technical notes.

a. Figures include women whose husbands practice contraception. See the technical note.

**Table 21. Labor Force**

Country	Percentage of population of working age (15–64 years)		Percentage of labor force in:						Average annual growth of labor force (percent)		
			Agriculture		Industry		Services				
	1965	1983	1965	1981 <sup>a</sup>	1965	1981 <sup>a</sup>	1965	1981 <sup>a</sup>	1965–73	1973–83	1980–2000
Low-income economies	52w	51w	84w	78w	7w	10w	9w	13w	2.2w	2.2w	2.8w
Low-income semi-arid	53w	51w	91w	82w	4w	9w	5w	9w	2.2w	2.1w	2.4w
1 Mali	53	50	93	73	4	12	3	15	2.2	2.0	2.6
2 Burkina	54	52	90	82	6	13	4	5	1.6	1.5	2.1
3 Niger	51	51	94	91	1	3	5	6	2.4	3.0	3.1
4 Somalia	49	53	87	82	5	8	8	10	3.8	2.0	1.7
5 Gambia, The	54	55	84	70*	8	9*	8	12	1.8	3.5	1.8
6 Chad	56	56	93	85	3	7	4	8	1.6	2.3	2.3
Other low-income	52w	51w	83w	77w	7w	10w	10w	13w	2.2w	2.2w	2.9w
7 Ethiopia	53	52	86	80	6	7	8	13	2.2	1.4	2.2
8 Zaire	53	51	81	75	10	13	9	12	1.8	2.2	3.0
9 Guinea-Bissau	..	53	89	83	5	6	6	11	..	..	2.8
10 Malawi	51	49	91	86	4	5	5	9	2.4	2.8	2.8
11 Uganda	53	50	88	83	5	6	7	11	3.0	1.7	3.4
12 Burundi	54	53	89	84	4	5	7	11	1.2	1.6	2.5
13 Tanzania	53	50	88	83	5	6	8	11	2.5	2.5	3.1
14 Rwanda	52	51	94	91	1	2	5	7	2.7	3.0	3.2
15 Central African Rep.	57	55	93	88	3	4	4	8	1.1	1.6	2.4
16 Togo	53	50	81	67	10	15	9	18	2.2	1.9	2.9
17 Benin	53	50	52	46	10	16	38	38	2.1	2.0	2.7
18 Guinea	55	53	87	82	7	11	6	7	1.2	1.3	2.4
19 Ghana	52	49	61	53	16	20	23	27	1.6	2.0	3.8
20 Madagascar	54	50	92	87	3	4	5	9	1.9	1.7	3.0
21 Sierra Leone	54	55	75	65	14	19	11	16	0.7	1.2	1.7
22 Kenya	49	46	84	78	6	10	10	12	3.2	2.9	4.0
23 Sudan	53	52	84	78	7	10	9	12	2.5	2.5	2.9
24 Mozambique	56	52	77	66	10	18	13	16	2.2	3.0	2.9
Middle-income oil importers	53w	51w	77w	69w	8w	11w	15w	20w	2.7w	2.6w	2.3w
25 Senegal	54	53	82	77	6	10	12	13	1.7	2.2	2.6
26 Lesotho	56	54	92	60	3	15	5	25	1.7	1.9	2.5
27 Liberia	51	53	78	70	11	14	11	16	2.0	3.9	2.8
28 Mauritania	52	53	90	69	4	8	6	23	1.9	2.4	2.0
29 Zambia	52	49	76	67	8	11	16	22	2.3	2.1	3.3
30 Côte d'Ivoire	55	53	87	79	3	4	10	17	4.2	3.8	3.3
31 Zimbabwe	51	46	67	60	12	15	21	25	2.7	1.4	4.4
32 Swaziland	53	50	86	74	5	9	9	17	2.6	2.1	3.2
33 Botswana	50	48	90	78	4	8	6	14	2.2	4.2	3.1
34 Mauritius	52	62	37	29	26	24	37	47	2.8	2.3	2.2
35 Namibia	54	52	59	51	19	25	22	24	1.9	1.9	3.1
Middle-income oil exporters	53w	50w	68w	57w	12w	18w	20w	26w	1.7w	1.9w	3.2w
36 Nigeria	52	50	67	54	12	19	21	27	1.8	2.0	3.3
37 Cameroon	56	51	86	83	6	7	8	10	1.9	1.8	3.2
38 Congo, People's Rep.	55	51	47	34	19	26	34	40	1.9	1.8	3.8
39 Gabon	62	58	83	77	8	11	9	12	0.5	-2.1	..
40 Angola	55	53	67	59	13	16	20	25	1.7	2.8	2.8
Upper-middle-income	54w	56w	32w	30w	30w	29w	38w	41w	2.7w	3.2w	2.9w
41 South Africa	54	56	32	30	30	29	38	41	2.7	3.2	2.9
Countries with populations less than 500,000	52w	56w	62w	44w	16w	17w	23w	38w	2.2w	1.8w	2.8w
42 São Tomé and Principe	..	56	..	56	..	8	..	36	..	..	..
43 Cape Verde	51	50	65	57	11	14	24	29	2.7	-1.5	3.8
44 Seychelles	53	57	..	17*	..	24*	..	59*	..	..	..
45 Comoros	52	51	69	64	20	23	11	13	1.8	1.8	3.2
46 Djibouti	..	52	..	2*	..	21*	..	77*	..	..	..
47 Equatorial Guinea	56	58	82	76	7	8	11	16	1.4	2.1	1.9
48 Reunion	51	63	42	30	21	21	37	49	3.0	3.2	2.5
Sub-Saharan Africa	53w	51w	75w	68w	10w	13w	15w	19w	2.1w	2.2w	2.9w

Note: For data comparability and coverage see the technical notes.

a. Figures with an asterisk are for years other than those specified.

**Table 22. Urbanization**

Country	Urban population				Percentage of urban population				Number of cities of over 500,000 persons	
	As percentage of total population		Average annual growth rate (percent)		In largest city		In cities of over 500,000 persons			
	1965	1983 <sup>a</sup>	1965-73	1973-83	1960	1980	1960	1980	1960	1980
Low-income economies	11w	20w	6.2w	6.2w	..	39w	3w	36w	1t	13t
Low-income semi-arid	11w	19w	6.3w	5.5w	..	33w	0w	0w	0t	0t
1 Mali	13	19	5.4	4.4	32	24	0	0	0	0
2 Burkina	6	11	6.5	4.8	..	41	0	0	0	0
3 Niger	7	14	7.0	7.0	..	31	0	0	0	0
4 Somalia	20	33	6.4	5.5	..	34	0	0	0	0
5 Gambia, The	16	30	6.4	6.5	..	..	0	0	0	0
6 Chad	9	20	6.9	6.6	..	39	0	0	0	0
Other low-income	11w	20w	6.1w	6.3w	29w	40w	4w	41w	1t	13t
7 Ethiopia	8	15	7.4	6.0	30	37	0	37	0	1
8 Zaire	19	38	5.9	6.9	14	28	14	38	1	2
9 Guinea-Bissau	16	26	4.1	7.2	..	..	..	..	..	..
10 Malawi	5	11	8.2	7.3	..	19	0	0	0	0
11 Uganda	6	7	8.3	0.3	38	52	0	52	0	1
12 Burundi	2	2	1.4	3.2	..	0	0	0	0	0
13 Tanzania	6	14	8.1	8.6	34	50	0	50	0	1
14 Rwanda	3	5	6.0	6.6	..	0	0	0	0	0
15 Central African Rep.	27	44	4.4	4.6	40	36	0	0	0	0
16 Togo	11	22	6.4	6.6	..	60	0	0	0	0
17 Benin	11	16	4.5	4.7	..	63	0	63	0	1
18 Guinea	12	26	5.0	6.3	37	80	0	80	0	1
19 Ghana	26	38	4.5	5.3	25	35	0	48	0	2
20 Madagascar	12	20	5.3	5.5	44	36	0	36	0	1
21 Sierra Leone	15	23	5.0	3.3	37	47	0	0	0	0
22 Kenya	9	17	7.3	8.0	40	57	0	57	0	1
23 Sudan	13	20	6.3	5.5	30	31	0	31	0	1
24 Mozambique	5	17	8.2	10.2	75	83	0	83	0	1
Middle-income oil importers	20w	36w	6.8w	6.4w	..	43w	0w	39w	0t	4t
25 Senegal	27	34	4.3	3.8	53	65	0	65	0	1
26 Lesotho	2	13	7.8	21.4	..	..	0	0	0	0
27 Liberia	23	38	5.3	6.1	..	0	0	0	0	0
28 Mauritania	7	25	16.0	4.6	..	39	0	0	0	0
29 Zambia	24	47	7.6	6.5	..	35	0	35	0	1
30 Côte d'Ivoire	23	44	8.2	8.5	27	34	0	34	0	1
31 Zimbabwe	14	24	6.8	6.0	40	50	0	50	0	1
32 Swaziland	7	18	5.7	12.8	..	..	..	..	..	..
33 Botswana	4	22	19.0	11.1	..	..	..	..	..	..
34 Mauritius	37	55	4.6	3.4	..	..	..	..	..	..
35 Namibia	28	49	6.1	5.6	..	..	..	..	..	..
Middle-income oil exporters	15w	24w	5.0w	5.6w	17w	20w	19w	51w	2t	11t
36 Nigeria	15	22	4.7	5.1	13	17	22	58	2	9
37 Cameroon	16	39	7.3	8.4	26	21	0	21	0	1
38 Congo, People's Rep.	35	55	4.4	5.5	77	56	0	0	0	0
39 Gabon	21	39	4.0	4.6	..	..	..	..	..	..
40 Angola	13	23	5.9	6.0	44	64	0	64	0	1
Upper-middle-income	47w	55w	2.6w	3.9w	16w	13w	44w	53w	4t	7t
41 South Africa	47	55	2.6	3.9	16	13	44	53	4	7
Countries with populations less than 500,000	25w	46w	5.5w	3.2w	..	..	..	..	..	..
42 São Tomé and Principe	..	32	5.8	5.3	..	..	..	..	..	..
43 Cape Verde	13	27	8.3	3.4	..	..	..	..	..	..
44 Seychelles	..	37*	..	6.2	..	..	..	..	..	..
45 Comoros	6	21	6.7	10.1	..	..	..	..	..	..
46 Djibouti	..	67	..	6.8	..	..	..	..	..	..
47 Equatorial Guinea	32	57	5.5	4.6	..	..	..	..	..	..
48 Reunion	38	58	5.0	3.2	..	..	..	..	..	..
Sub-Saharan Africa	16w	25w	6.1w	5.6w	23w	30w	17w	43w	7t	35t

Note: For data comparability and coverage see the technical notes.

a. Figures with an asterisk are for years other than those specified.

**Table 23. Indicators Related to Life Expectancy**

Country	Life expectancy at birth (years)				Infant mortality rate (aged under 1)		Child death rate (aged 1-4)	
	Male 1965	Male 1983	Female 1965	Female 1983	1965	1983 <sup>a</sup>	1965	1983
<b>Low-income economies</b>	<b>42w</b>	<b>46w</b>	<b>45w</b>	<b>49w</b>	<b>156w</b>	<b>120w</b>	<b>36w</b>	<b>23w</b>
<b>Low-income semi-arid</b>	<b>38w</b>	<b>43w</b>	<b>40w</b>	<b>46w</b>	<b>182w</b>	<b>145w</b>	<b>47w</b>	<b>30w</b>
1 Mali	37	43	39	47	184	148	47	31
2 Burkina	40	43	42	46	193	148	52	31
3 Niger	40	43	42	47	181	139	46	28
4 Somalia	..	43	..	46	166	142	37	30
5 Gambia, The	36	41	37	42	119	200	54	46
6 Chad	39	42	41	45	184	142	47	29
<b>Other low-income</b>	<b>42w</b>	<b>47w</b>	<b>45w</b>	<b>50w</b>	<b>152w</b>	<b>116w</b>	<b>34w</b>	<b>22w</b>
7 Ethiopia	43	..	47	..	166	..	37	..
8 Zaire	43	49	46	52	142	106	30	20
9 Guinea-Bissau	34	37	36	38	197	158	53	36
10 Malawi	37	43	40	45	201	164	55	38
11 Uganda	46	48	49	50	126	108	26	21
12 Burundi	42	45	45	48	169	123	38	25
13 Tanzania	41	49	44	52	138	97	29	18
14 Rwanda	47	45	51	48	159	125	35	26
15 Central African Rep.	40	46	41	49	184	142	47	29
16 Togo	40	47	43	50	158	112	36	17
17 Benin	41	46	43	50	193	148	52	31
18 Guinea	34	37	36	38	197	158	53	36
19 Madagascar	41	49	44	50	99	66	18	10
20 Ghana	49	57	52	61	132	97	25	12
21 Sierra Leone	32	37	33	38	230	198	69	54
22 Kenya	48	55	51	59	124	81	25	14
23 Sudan	39	47	41	49	161	117	37	19
24 Mozambique	36	44	39	47	148	109	31	16
<b>Middle-income oil importers</b>	<b>45w</b>	<b>50w</b>	<b>48w</b>	<b>54w</b>	<b>141w</b>	<b>105w</b>	<b>30w</b>	<b>18w</b>
25 Senegal	40	44	42	47	172	140	42	28
26 Lesotho	47	51	50	55	138	109	20	14
27 Liberia	41	47	43	50	149	111	32	17
28 Mauritania	39	44	41	47	171	136	41	16
29 Zambia	42	49	46	52	137	100	29	19
30 Côte d'Ivoire	43	50	45	53	160	121	37	20
31 Zimbabwe	50	52	58	60	106	69	15	7
32 Swaziland	45	51	49	55	148	128	32	27
33 Botswana	54	62	58	66	108	74	21	13
34 Mauritius	59	65	63	69	64	32	9	3
35 Namibia	49	56	51	60	146	114	31	23
<b>Middle-income oil exporters</b>	<b>40w</b>	<b>48w</b>	<b>43w</b>	<b>50w</b>	<b>155w</b>	<b>115w</b>	<b>34w</b>	<b>18w</b>
36 Nigeria	40	47	43	50	152	113	33	17
37 Cameroon	44	52	47	55	155	116	34	19
38 Congo, People's Rep.	52	62	56	65	116	82	19	8
39 Gabon	42	48	44	51	147	111	32	22
40 Angola	34	42	37	44	193	148	52	31
<b>Upper-middle-income</b>	<b>54w</b>	<b>62w</b>	<b>57w</b>	<b>68w</b>	<b>124w</b>	<b>91w</b>	<b>22w</b>	<b>10w</b>
41 South Africa	54	62	57	65	124	91	22	10
<b>Countries with populations less than 500,000</b>	<b>39w</b>	<b>55w</b>	<b>42w</b>	<b>58w</b>	<b>102w</b>	<b>77w</b>	<b>19w</b>	<b>14w</b>
42 São Tomé and Principe	..	61	..	65	77	62	..	..
43 Cape Verde	52	62	56	65	110	76	21	13
44 Seychelles	..	68	..	72	59	27	..	2
45 Comoros	42	52	49	56	..	148*	25	26
46 Djibouti	..	46	..	49	..	30*	..	10
47 Equatorial Guinea	33	43	36	45	178	136	41	29
48 Reunion	57	65	61	69	79	19	13	1
<b>Sub-Saharan Africa</b>	<b>42w</b>	<b>48w</b>	<b>46w</b>	<b>51w</b>	<b>152w</b>	<b>118w</b>	<b>34w</b>	<b>20w</b>

Note: For data comparability and coverage see the technical notes.

a. Figures with an asterisk are for years other than those specified.

**Table 24. Health-Related Indicators**

Country	Population per				Daily calorie supply per capita	
	Physician		Nursing person		Total, 1982	As percentage of requirement 1982
	1965*	1980	1965*	1980		
Low-income economies	38,621w	28,803w	4,512w	3,322w	2,097w	91w
Low-income semi-arid	61,194w	34,020w	5,761w	3,627w	1,963w	84w
1 Mali	49,010	22,130	3,200	2,380	1,731	74
2 Burkina	74,110	48,510	4,170	4,950	1,879	79
3 Niger	71,440	38,790	6,210	4,650	2,456	105
4 Somalia	35,060	15,630	3,630	2,550	2,102	91
5 Gambia, The	27,930	12,310	1,780*	1,770	2,207	86
6 Chad	73,040	47,640	13,620	3,860	1,620	68
Other low-income	35,305w	28,065w	4,181w	3,279w	2,116w	92w
7 Ethiopia	70,190	69,390	5,970	5,910	2,162	93
8 Zaire	39,050	13,940	..	1,810	2,169	98
9 Guinea-Bissau	2,500	8,840	4,770*	980	2,241	68
10 Malawi	46,900	41,460	12,670	3,830	2,242	97
11 Uganda	11,080	26,810	3,130	4,180	1,807	78
12 Burundi	54,930	45,020	7,310	..	2,206	95
13 Tanzania	21,840	17,740	2,100	3,010	2,331	101
14 Rwanda	74,170	31,340	7,450	9,790	2,202	95
15 Central African Rep.	44,490	26,750	3,000	1,740	2,194	97
16 Togo	24,980	18,100	4,990	1,430	2,167	94
17 Benin	28,790	16,980	2,540	1,660	2,154	101
18 Guinea	54,610	17,110	4,750	2,570	1,987	86
19 Ghana	12,040	7,160	3,710	770	1,573	68
20 Madagascar	9,900	10,220	3,620	3,670	2,577	114
21 Sierra Leone	18,400	17,520	4,890	2,040	2,049	85
22 Kenya	12,840	7,890	1,780	550	2,056	88
23 Sudan	23,500	8,930	3,360	1,430	2,250	96
24 Mozambique	18,700	39,140	4,720	5,610	1,844	79
Middle-income oil importers	16,002w	9,551w	3,050w	1,433w	2,336w	100w
25 Senegal	21,130	13,780	2,640	1,390	2,392	101
26 Lesotho	22,930	18,640	4,700	..	2,285	100
27 Liberia	12,450	8,550	2,300	2,940	2,267	98
28 Mauritania	36,580	14,500	..	2,100	2,228	97
29 Zambia	11,390	7,670	5,820	1,730	2,054	89
30 Côte d'Ivoire	20,690	..	1,850	..	2,652	115
31 Zimbabwe	5,190	5,900	990	940	2,119	89
32 Swaziland	7,920	7,900	7,760	1,040	2,570	96
33 Botswana	22,090	..	5,960*	..	2,445	94
34 Mauritius	3,850	2,010	2,000	610	2,882	128
35 Namibia	..	..	..	..	2,075	93
Middle-income oil exporters	40,376w	12,440w	5,128w	2,861w	2,389w	102w
36 Nigeria	44,990	12,550	5,780	3,010	2,443	104
37 Cameroon	29,720	13,990	1,970	1,950	2,102	91
38 Congo, People's Rep.	14,210	5,510	950	790	2,504	113
39 Gabon	9,510	3,030	800	..	2,859	88
40 Angola	12,000	..	3,820	..	2,041	87
Upper-middle-income	2,140w	..	530w	..	2,840w	116w
41 South Africa	2,140	..	530	..	2,840	116
Countries with populations less than 500,000	6,971w	3,929w	1,545w	918w	2,533w	115w
42 São Tomé and Principe	3,750*	1,860	800*	670	2,068	88
43 Cape Verde	8,960*	5,480	4,150*	1,200	2,801	129
44 Seychelles	3,030*	2,320	520*	250	..	..
45 Comoros	18,310	9,850	2,200	2,650	2,425	111
46 Djibouti	4,440	1,900	930*	550	..	..
47 Equatorial Guinea	5,400*	..	..	..	..	..
48 Reunion	2,980	1,360	720	250	2,537	117
Sub-Saharan Africa	34,396w	22,820w	4,203w	3,056w	2,247w	96w

Note: For data comparability and coverage see the technical note.

a. Figures with an asterisk are for years other than those specified. See the technical notes.

**Table 25. Education**

Country	Number enrolled in primary school as percentage of age group						Number enrolled in secondary school as percentage of age group		Number enrolled in higher education as percentage of population aged 20-24	
	Total		Male		Female		1965	1982 <sup>a</sup>	1965	1982
	1965	1982 <sup>a</sup>	1965	1982 <sup>a</sup>	1965	1982 <sup>a</sup>	1965	1982 <sup>a</sup>	(.)w	lw
<b>Low-income economies</b>	<b>39w</b>	<b>68w</b>	<b>50w</b>	<b>39w</b>	<b>28w</b>	<b>29w</b>	<b>4w</b>	<b>13w</b>	<b>(.)w</b>	<b>lw</b>
<b>Low-income semi-arid</b>	<b>18w</b>	<b>28w</b>	<b>22w</b>	<b>33w</b>	<b>10w</b>	<b>19w</b>	<b>2w</b>	<b>6w</b>	<b>(.)w</b>	<b>lw</b>
1 Mali	24	27	32	35	16	20	4	9	(.)	(.)
2 Burkina	12	28	16	28	8	16	1	3	(.)	1
3 Niger	11	23	15	29	7	17	1	5	..	(.)
4 Somalia	10	30	16	38	4	21	2	11	(.)	1
5 Gambia, The	21	56	29	71	12	41	6	16	..	..
6 Chad	34	..	56	..	13	..	1	3	..	(.)
<b>Other low-income</b>	<b>42w</b>	<b>73w</b>	<b>55w</b>	<b>40w</b>	<b>30w</b>	<b>29w</b>	<b>4w</b>	<b>14w</b>	<b>(.)w</b>	<b>lw</b>
7 Ethiopia	11	46	16	60	6	33	2	12	(.)	1
8 Zaire	70	90	95	104	45	75	5	23	(.)	1
9 Guinea-Bissau	26	88	38	119	13	57	2	15	(.)	(.)
10 Malawi	44	62	55	73	32	51	2	4	(.)	(.)
11 Uganda	67	60	83	69	50	51	4	8	(.)	1
12 Burundi	26	33	36	41	15	25	1	3	(.)	1
13 Tanzania	32	98	40	101	25	95	2	3	(.)	(.)
14 Rwanda	53	70	64	72	43	67	2	2	(.)	(.)
15 Central African Rep.	56	70	84	92	28	50	2	14	..	1
16 Togo	55	106	78	129	32	84	5	27	(.)	2
17 Benin	34	65	48	87	21	42	3	21	(.)	2
18 Guinea	31	33	44	44	19	22	5	16	(.)	3
19 Ghana	69	76	82	85	57	66	13	34	1	1
20 Madagascar	65	100	70	..	59	..	8	14	1	3
21 Sierra Leone	29	40	37	..	21	..	5	12	(.)	1
22 Kenya	54	104	69	114	40	94	4	20	(.)	1
23 Sudan	29	52	37	61	21	43	4	18	1	2
24 Mozambique	37	104	48	119	26	72	3	6	(.)	(.)
<b>Middle-income oil importers</b>	<b>67w</b>	<b>48w</b>	<b>77w</b>	<b>47w</b>	<b>57w</b>	<b>38w</b>	<b>6w</b>	<b>19w</b>	<b>(.)w</b>	<b>2w</b>
25 Senegal	40	48	52	58	29	38	7	12	1	3
26 Lesotho	94	112	74	95	114	129	4	20	(.)	2
27 Liberia	41	66	59	82	23	50	5	20	1	2
28 Mauritania	13	33	19	43	6	23	1	10	..	..
29 Zambia	53	96	59	102	46	90	7	16	..	2
30 Côte d'Ivoire	60	76	80	92	41	60	6	17	(.)	3
31 Zimbabwe	110	130	128	134	92	125	6	23	(.)	1
32 Swaziland	74	111	76	111	71	111	8	42	..	..
33 Botswana	65	102	59	94	71	110	3	23	..	..
34 Mauritius	101	106	105	107	97	105	26	51	(.)	..
35 Namibia	..	..	..	..	..	..	..	..	(.)	..
<b>Middle-income oil exporters</b>	<b>40w</b>	<b>99w</b>	<b>49w</b>	<b>117w</b>	<b>30w</b>	<b>97w</b>	<b>5w</b>	<b>17w</b>	<b>(.)w</b>	<b>3w</b>
36 Nigeria	32	98	39	..	24	..	5	16	(.)	3
37 Cameroon	94	107	114	117	75	97	5	19	(.)	2
38 Congo, People's Rep.	114	..	134	..	94	..	10	69	1	6
39 Gabon	134	..	146	..	122	..	11	..	..	..
40 Angola	39	..	53	..	26	..	5	..	(.)	(.)
<b>Upper-middle-income</b>	<b>90w</b>	<b>..</b>	<b>91w</b>	<b>..</b>	<b>88w</b>	<b>..</b>	<b>15w</b>	<b>..</b>	<b>4w</b>	<b>..</b>
41 South Africa	90	..	91	..	88	..	15	..	4	..
<b>Countries with populations less than 500,000</b>	<b>..</b>	<b>73w</b>	<b>..</b>	<b>..</b>	<b>..</b>	<b>..</b>	<b>..</b>	<b>..</b>	<b>(.)w</b>	<b>..</b>
42 São Tomé and Principe	..	..	..	..	..	..	..	..	(.)	..
43 Cape Verde	..	..	..	..	..	..	..	..	(.)	..
44 Seychelles	..	95*	..	..	..	..	..	..	..	..
45 Comoros	24	103*	36	120*	12	85*	..	25*	(.)	..
46 Djibouti	..	32	..	..	..	..	..	8	..	..
47 Equatorial Guinea	65	78*	79	87*	52	69*	..	11*	(.)	..
48 Reunion	148	..	148	..	148	..	32	..	(.)	..
<b>Sub-Saharan Africa</b>	<b>46w</b>	<b>71w</b>	<b>55w</b>	<b>42w</b>	<b>28w</b>	<b>31w</b>	<b>5w</b>	<b>15w</b>	<b>1w</b>	<b>2w</b>

Note: For data comparability and coverage see the technical notes.

a. Figures with an asterisk are for years other than those specified. See the technical notes.

## Technical Notes

This statistical annex provides social indicators for selected years in a form suitable for comparing economies and groups of economies. Considerable effort has been made to standardize the data; nevertheless, statistical methods, coverage, practices, and definitions differ widely. In addition, the statistical systems in most of the African countries still are weak, which affects the availability and reliability of the data. Readers are urged to exercise caution and to take these limitations into account in interpreting the indicators, particularly when making comparisons across economies.

All growth rates shown are in constant prices and, unless otherwise noted, have been computed by using the least-squares method. The least-squares growth rate,  $r$ , is estimated by fitting a least-squares linear trend line to the logarithmic annual values of the variable in the relevant period. More specifically, the regression equation takes the form of  $\log X_t = a + bt + e_t$ , where this is equivalent to the logarithmic transformation of the compound growth rate equation

$$X_t = X_0(1 + r)^t.$$

In these equations,  $X_t$  is the variable,  $t$  is time, and  $a = \log X_0$  and  $b = \log (1 + r)$  are the parameters to be estimated;  $e_t$  is the error term. If  $b^*$  is the least-squares estimate of  $b$ , then the annual average growth rate,  $r$ , is obtained as  $[\text{antilog}(b^*)] - 1$ .

**Table 1. Basic Indicators**

The estimates of *population* for mid-1983 are primarily based on data from the U.N. Population Division. In many cases the data take into account the results of recent population censuses. Refugees not permanently settled in the country of asylum are generally considered to be part of the population of their country of origin. The data on area are from the computer tape for the FAO *Production Yearbook, 1983*.

*Gross national product* (GNP) measures the total domestic and foreign output claimed by residents. It comprises gross domestic product adjusted by net factor income from abroad. That income comprises the income residents receive from abroad for factor services (labor, investment, and interest) less similar payments made to nonresidents who contributed to the domestic economy. It is calculated without making deductions for depreciation.

The GNP *per capita* figures were calculated according to the newly revised *World Bank Atlas* method. The Bank recognizes that perfect cross-country comparability of GNP per capita estimates cannot be achieved. Beyond the classic, strictly intractable "index number problem," two obstacles stand in the way of adequate comparability. One concerns GNP numbers themselves. There are differences in the national accounting systems of

countries and in the coverage and reliability of underlying statistical information between various countries. The other relates to the conversion of GNP data, expressed in different national currencies, to a common numeraire, conventionally the U.S. dollar, to compare them across countries. The Bank's procedure for converting GNP to U.S. dollars is essentially based on the use of a three-year average of the official exchange rate. For a few countries, however, the prevailing official exchange rate does not fully reflect the rate effectively applied to actual foreign exchange transactions and in these cases an alternative conversion factor is used.

Recognizing that these shortcomings affect the comparability of the GNP per capita estimates, the World Bank has introduced several improvements in the estimation procedures. Through its regular review of national accounts of its member countries, the World Bank systematically evaluates the GNP estimates, focusing on the coverage and concepts employed, and where appropriate makes adjustments to improve comparability. The Bank also undertakes a systematic review to assess the appropriateness of the exchange rates as conversion factors. For a very small number of countries, an alternative conversion factor is used when the official exchange rate is judged to diverge by an exceptionally large margin from the rate effectively applied to foreign transactions.

In an effort to achieve greater comparability, the U.N. International Comparison Project (ICP) has developed measures of GDP using purchasing-power parities rather than exchange rates. So far the project covers only a limited set of countries, and some inherent methodological issues remain unresolved. Summary findings of the fourth phase of the ICP, relating to the comparison of GDPs, will be published when these data become available. Readers are referred to Irving Kravis, Alan Heston, and Robert Summers, *World Product and Income: International Comparisons of Real Gross Product* (Baltimore, Md.: Johns Hopkins University Press, 1982), which reported on phase three of the project.

The estimates of 1983 GNP and 1983 per capita GNP are calculated on the basis of the 1981–83 base period. With this method, the first step is to calculate the conversion factor. This is done by taking the simple arithmetic average of the actual exchange rate for 1983 and of deflated exchange

rates for 1981 and 1982. To obtain the latter, the actual exchange rate for 1981 is multiplied by the relative rate of inflation for the country and for the United States between 1981 and 1983; the actual exchange rate for 1982 is multiplied by the relative rate of inflation for the country and the United States between 1982 and 1983.

This average of the actual and the deflated exchange rates is intended to smooth the impact of fluctuations in prices and exchange rates. The second step is to convert the GNP at current market prices and in national currencies of the year 1983 by means of the conversion factor as derived above. Then the resulting GNP in 1983 U.S. dollars is divided by the midyear population to derive the 1983 per capita GNP in current U.S. dollars. The preliminary estimates of GNP per capita for 1983 are shown in this table.

The following formulas describe the procedure for computing the conversion factor for year  $t$ :

$$(e_{t-2,t}^*) = \frac{1}{3} \left[ e_{t-2} \left( \frac{P_t}{P_{t-2}} / \frac{P_t^\$}{P_{t-2}^\$} \right) + e_{t-1} \left( \frac{P_t}{P_{t-1}} / \frac{P_t^\$}{P_{t-1}^\$} \right) + e_t \right]$$

and for calculating per capita GNP in U.S. dollars for year  $t$ :

$$(Y_t^\$) = Y_t / N_t + e_{t-2,t}^*$$

where:

$Y_t$  = current GNP (local currency) for year  $t$

$P_t$  = GNP deflator for year  $t$

$e_t$  = annual average exchange rate (local currency/U.S. dollars) for year  $t$

$N_t$  = midyear population for year  $t$

$P_t^\$$  = U.S. GNP deflator for year  $t$

The *average annual rate of inflation* is the least-squares growth rate of the implicit GDP deflator for each of the periods shown. The GDP deflator is first calculated by dividing, for each year of the period, the value of GDP in current market prices by the value of GDP in constant market prices, both in national currency. The least-squares method is then used to calculate the growth rate of the GDP deflator for the period. This measure of inflation, like any other measure of inflation, has limitations. For some purposes, however, it is used as an indicator of inflation because it is the most broadly based deflator, showing annual price movements for all goods and services produced in an economy.

*Life expectancy at birth* indicates the number of years a newborn infant would live if patterns of mortality prevailing for all people at the time of its birth were to stay the same throughout its life. Data are from the U.N. Population Division, supplemented by World Bank estimates.

The summary measures for GNP per capita and life expectancy in this table are weighted by population. The summary measures for average annual rates of inflation are weighted by the share of country GDP for the entire period in the particular income group.

**Table 19. Population Growth, Past and Projected, and Population Momentum**

The *growth rates of population* are period averages calculated from midyear populations. The summary measures are weighted by population in 1970.

The estimates of *population* for mid-1983 are primarily based on data from the U.N. Population Division and from World Bank sources. In many cases the data take into account the results of recent population censuses. Note again that refugees not permanently settled in the country of asylum are generally considered to be part of the population of their country of origin.

The *projections of population* for 1990 and 2000, and to the year in which it will eventually become stationary, were made for each economy separately. Starting with information on total population by age and sex, fertility rates, mortality rates, and international migration in the base year 1980, these parameters were projected at five-year intervals on the basis of generalized assumptions until the population became stationary. The base-year estimates are from updated computer printouts of the U.N. *World Population Prospects as Assessed in 1982*, from the most recent issues of the U.N. *Population and Vital Statistics Report* and *International Migration: Levels and Trends*, and from the World Bank, the Population Council, the U.S. Bureau of the Census, *Demographic Statistics* (Eurostat 1984), and national censuses.

The *net reproduction rate* (NRR) indicates the number of daughters a newborn girl will bear during her lifetime, assuming fixed age-specific fertility rates and a fixed set of mortality rates. The NRR thus measures the extent to which a cohort of newborn girls will reproduce themselves under given

schedules of fertility and mortality. An NRR of 1 indicates that fertility is at replacement level: at this rate childbearing women, on the average, bear only enough daughters to replace themselves in the population.

A *stationary population* is one in which age-specific and sex-specific mortality rates have not changed over a long period, while age-specific fertility rates have simultaneously remained at replacement level ( $NRR = 1$ ). In such a population, the birth rate is constant and equal to the death rate, the age structure also is constant, and the growth rate is zero.

*Population momentum* is the tendency for population growth to continue beyond the time that replacement-level fertility has been achieved; that is, even after the NRR has reached unity. The momentum of a population in the year  $t$  is measured as a ratio of the ultimate stationary population to the population in the year  $t$ , given the assumption that fertility remains at replacement level from the year  $t$  onward. In India, for example, in 1985 the population was 765 million, the ultimate stationary population (assuming that  $NRR = 1$  from 1985 onward) is 1,349 million, and the population momentum is 1.76.

A population tends to grow even after fertility has declined to replacement level because past high growth rates will have produced an age distribution with a relatively high proportion of women in, or still to enter, the reproductive ages. Consequently, the birth rate will remain higher than the death rate and the growth rate will remain positive for several decades. A population takes fifty to seventy-five years, depending on the initial conditions, before its age distribution fully adjusts to the changed fertility rates.

To make the projections, assumptions about future mortality rates were made in terms of female life expectancy at birth (that is, the number of years a newborn girl would live if subject to the mortality risks prevailing for the cross-section of population at the time of her birth). Economies were first divided according to whether their primary-school enrollment ratio for females was above or below 70 percent. In each group a set of annual increments in female life expectancy was assumed, depending on the female life expectancy in 1980–85. For a given life expectancy at birth, the annual increments during the projection period are larger in economies having a higher primary-

school enrollment ratio and a life expectancy of up to 62.5 years. At higher life expectancies, the increments are the same.

To project fertility rates, the first step was to estimate the year in which fertility would reach replacement level. These estimates are speculative and are based on information on trends in crude birth rates (defined in the note for Table 20), total fertility rates (also defined in the note for Table 20), female life expectancy at birth, and the performance of family planning programs. For most countries in Sub-Saharan Africa total fertility rates were assumed to remain constant for some time and then to decline until replacement level was reached; for a few they were assumed to increase until 1990–95 and then to decline.

International migration rates are based on past and present trends in migration flow. The estimates of future net migration are speculative. For most economies the net migration rates were assumed to be zero by 2000, but for a few they were assumed to be zero by 2025.

The estimates of the hypothetical size of the stationary population and the assumed year of reaching replacement level fertility are speculative. *They should not be regarded as predictions.* They are included to provide a summary indication of the long-run implications of recent fertility and mortality trends on the basis of highly stylized assumptions. A fuller description of the methods and assumptions used to calculate the estimates is available in World Bank, *World Population Projections 1984—Short- and Long-term Estimates by Age and Sex with Related Demographic Statistics*.

**Table 20. Demographic and Fertility-Related Indicators**

The *crude birth and death rates* indicate the number of live births and deaths per thousand population in a year. They are from the same sources mentioned in the note for Table 19. Percentage changes are computed from unrounded data.

The *total fertility rate* represents the number of children that would be born per woman, if she were to live to the end of her childbearing years and bear children at each age in accord with prevailing age-specific fertility rates. The rates given are from the same sources mentioned in the note for Table 19.

The *percentage of married women of childbearing age using contraception* refers to women who are practicing, or whose husbands are practicing, any form of contraception. These generally comprise male and female sterilization, intrauterine devices (IUDs), condoms, injectable and oral contraceptives, spermicides, diaphragms, rhythm, withdrawal, and abstinence. Women of childbearing age are generally women aged 15–49, although for some countries contraceptive usage is measured for other age groups.

Data are mainly derived from the World Fertility Survey, the Contraceptive Prevalence Survey, the World Bank, and the U.N. report, *Recent Levels and Trends of Contraceptive Use as Assessed in 1983*. For a few countries for which no survey data are available, program statistics are used. Program statistics may underestimate contraceptive prevalence because they do not measure use of methods such as rhythm, withdrawal, or abstinence, or of contraceptives not obtained through the official family planning program. The data refer to a variety of years, generally not more than two years distant from those specified.

All summary measures are weighted by population.

#### **Table 21. Labor Force**

The *population of working age* refers to the population aged 15–64. The estimates are based on the population estimates of the World Bank for 1983 and previous years. The summary measures are weighted by population.

The *labor force* comprises economically active persons aged 10 years and over, including the armed forces and the unemployed, but excluding housewives, students, and other economically inactive groups. The estimates of the sectoral distribution of the labor force are from International Labour Organisation (ILO), *Labour Force Estimates and Projections, 1950–2000*, and from the World Bank. The summary measures are weighted by labor force.

The *labor force growth rates* were derived from the Bank's population projections and from ILO data on age-specific activity rates in the source cited above. The summary measures for 1965–73 and 1973–83 are weighted by labor force in 1973; those for 1980–2000, by the labor force in 1980.

The application of ILO activity rates to the

Bank's latest population estimates may be inappropriate for some economies in which there have been important changes in unemployment and underemployment, in international and internal migration, or in both. The labor force projections for 1980–2000 should thus be treated with caution.

#### **Table 22. Urbanization**

The data on *urban population as a percentage of total population* are from the U.N. *Estimates and Projections of Urban, Rural and City Populations 1950–2025: The 1982 Assessment, 1985*, supplemented by data from the World Bank, the U.S. Bureau of the Census, and various issues of the U.N. *Demographic Yearbook*.

The *growth rates of urban population* were calculated from the World Bank's population estimates; the estimates of urban population shares were calculated from the sources cited above. Data on urban agglomeration are from the U.N. *Patterns of Urban and Rural Population Growth, 1980*.

Because the estimates in this table are based on different national definitions of what is "urban," cross-country comparisons should be interpreted with caution.

The summary measures for urban population as a percentage of total population are weighted by population; the other summary measures in this table are weighted by urban population.

#### **Table 23. Indicators Related to Life Expectancy**

*Life expectancy at birth* is defined in the note for Table 1.

The *infant mortality rate* is the number of infants who die before reaching 1 year of age, per thousand live births in a given year. The data are from a variety of sources, including issues of the U.N. *Demographic Yearbook* and *Population and Vital Statistics Report*, and "Infant Mortality: World Estimates and Projections, 1950–2025," *Population Bulletin of the United Nations* (1983), and from the World Bank.

The *child death rate* is the number of deaths of children aged 1–4 per thousand children in the same age group in a given year. Estimates were based on the data on infant mortality and on the relation between the infant mortality rate and the child death rate implicit in the appropriate Coale-

Demeny Model life tables; see Ansley J. Coale and Paul Demeny, *Regional Model Life Tables and Stable Populations* (Princeton, N.J.: Princeton University Press, 1966).

The summary measures in this table are weighted by population.

#### **Table 24. Health-Related Indicators**

The estimates of *population per physician and nursing person* were derived from World Health Organization (WHO) data, some of which have been revised to reflect new information. They also take into account revised estimates of population. Nursing persons include graduate, practical, assistant, and auxiliary nurses; the inclusion of auxiliary nurses enables a better estimation of the availability of nursing care. Because definitions of nursing personnel vary—and because the data shown are for a variety of years, generally not more than two years distant from those specified—the data for these two indicators are not strictly comparable across countries.

The *daily calorie supply per capita* was calculated by dividing the calorie equivalent of the food supplies in an economy by the population. Food supplies comprise domestic production, imports less exports, and changes in stocks; they exclude animal feed, seeds for use in agriculture, and food lost in processing and distribution. The *daily calorie requirement per capita* refers to the calories needed to sustain a person at normal levels of activity and health, taking into account age and sex distributions, average body weights, and environmental temperatures. Both sets of estimates are from the Food and Agriculture Organization (FAO).

The summary measures in this table are weighted by population.

#### **Table 25. Education**

The data in this table refer to a variety of years, generally not more than two years distant from those specified, and are mostly from Unesco.

The data on *number enrolled in primary school* refer to estimates of total, male, and female enrollment of students of all ages in primary school; they are expressed as percentages of the total, male, or female populations of the primary-school age to give gross primary enrollment ratios. While many

countries consider primary-school age to be 6–11 years, others do not. The differences in country practices in the ages and duration of schooling are reflected in the ratios given. For some countries with universal primary education, the gross enrollment ratios may exceed 100 percent because some pupils are below or above the country's standard primary-school age.

The data on *number enrolled in secondary school* were calculated in the same manner, with secondary-school age considered to be 12–17 years.

The data on *number enrolled in higher education* are from Unesco.

The summary measures in this table are weighted by population.

## Data Sources

### National accounts and economic indicators

- International Monetary Fund. 1974. *Draft Manual on Government Finance Statistics*. Washington, D.C.
- \_\_\_\_\_. 1983. *Government Finance Statistics Yearbook*. Vol. VII. Washington, D.C.
- Sawyer, Malcolm. 1976. *Income Distribution in OECD Countries*. OECD Occasional Studies. Paris.
- UN Department of International Economic and Social Affairs. Various years. *Statistical Yearbook*. New York.
- \_\_\_\_\_. 1968. *A System of National Accounts*. New York.
- \_\_\_\_\_. 1981. *A Survey of National Sources of Income Distribution Statistics*. Statistical Papers, Series M. no. 72. New York.
- Food and Agriculture Organization, International Monetary Fund, and U.N. Industrial Development Organization data files.

National sources. World Bank country documentation. World Bank data files.

### Labor force

- International Labour Organisation. 1977. *Labour Force Estimates and Projections, 1950–2000*, 2nd ed. Geneva.
- International Labour Organisation tapes. World Bank data files.

### Population

- Statistical Office of the European Communities (Eurostat). 1984. *Demographic Statistics*. Luxembourg.
- U.N. Department of International Economic and Social Affairs. Various years. *Demographic Yearbook*. New York.
- \_\_\_\_\_. Various years. *Population and Vital Statistics Report*. New York.
- \_\_\_\_\_. 1980. *Patterns of Urban and Rural Population Growth*. New York.
- \_\_\_\_\_. 1982. "Infant Mortality: World Estimates and Projections, 1950–2025." *Population Bulletin of the United Nations*, no. 14. New York.
- \_\_\_\_\_. Updated printout. *World Population Trends and Policies: 1983 Monitoring Report*. New York.
- \_\_\_\_\_. 1983. *World Population Trends and Policies: 1983 Monitoring Report*. New York.
- \_\_\_\_\_. 1984. *Recent Levels and Trends of Contraceptive Use as Assessed in 1983*. New York.
- \_\_\_\_\_. 1985. *Estimates and Projection of Urban, Rural and City Populations, 1950–2025; The 1982 Assessment*. New York.
- U.S. Bureau of the Census. 1983. *World Population: 1983*. Washington, D.C.
- World Bank data files.

### Social indicators

- Food and Agriculture Organization. October 1980; October 1984. *Food Aid Bulletin*. Rome.
- \_\_\_\_\_. 1983. *Fertilizer Yearbook*. Rome.
- \_\_\_\_\_. 1983. *Production Yearbook*. "Standard" computer tape.
- \_\_\_\_\_. 1983. *Trade Yearbook*. "Standard" computer tape.
- U.N. Department of International Economic and Social Affairs. Various years. *Demographic Yearbook*. New York.
- \_\_\_\_\_. Various years. *Statistical Yearbook*. New York.
- U.N. Educational, Scientific, and Cultural Organization. Various years. *Statistical Yearbook*. Paris.
- World Health Organization. Various years. *World Health Statistics Annual*. Geneva.
- \_\_\_\_\_. 1976. *World Health Statistics Report*, vol. 29, no. 10. Geneva.
- World Bank data files.



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