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Early Signs of Decline

In recent years U.N. demographers have stunned the world by announcing that life expectancy among the 750 million people living in sub-Saharan Africa has dropped from 61 to 48 years. This precipitous drop was primarily the result of governments' failure to check the spread of the HIV virus. While industrial countries held HIV infection rates among adults under 1 percent, in some African countries they climbed above 30 percent.¹

For the first time in the modern era, life expectancy, a seminal indicator of development, has dropped for a large segment of humanity. For the people of sub-Saharan Africa, a failure of leadership is quite literally reversing the march of progress. Is this failure of the political system an anomaly? Or is it an early sign that the scale of emerging problems can overwhelm our political institutions?

During the decades following World War II, life expectancy climbed throughout the world with advances in public health, vaccines, antibiotics, and food production. But as the twentieth century drew to a close, the HIV epidemic brought this trend to an end in many countries.²

Today the variation in life expectancy among countries is

wider than at any time in history, ranging from a low of 33 in Swaziland and 37 in Botswana to a high of 82 in Japan and 81 in Iceland. Not surprisingly, life expectancy usually correlates with income levels except where the distribution of income is heavily skewed. In the United States, where income is concentrated among the wealthy and where some 24 million Americans are without health insurance, life expectancy is shorter than in countries like Sweden, Germany, or Japan. Indeed, U.S. life expectancy of 77 years now lags behind the 78 years of Costa Rica, a developing country.³

The stresses in our early twenty-first century civilization take many forms. Economically we see them in the widening income gap between the world's rich and poor. Socially they take the form of the widening gap in education and health care and a swelling flow of environmental refugees as productive land turns to desert and as wells go dry. Politically we see them manifest in conflict over basic resources such as cropland, grazing land, and water. And perhaps most fundamentally, we see the stresses the world is facing in the growing number of failed and failing states.

Our Socially Divided World

The social and economic gap between the world's richest 1 billion people and its poorest 1 billion has no historical precedent. Not only is this gap wide, it is widening. The poorest billion are trapped at a subsistence level and the richest billion are becoming wealthier with each passing year. The economic gap can be seen in the contrasts in nutrition, education, disease patterns, family size, and life expectancy.

World Health Organization (WHO) data indicate that roughly 1.2 billion people are undernourished, underweight, and often hungry. At the same time, roughly 1.2 billion people are overnourished and overweight, most of them suffering from excessive caloric intake and exercise deprivation. So while 1 billion people worry whether they will eat, another billion should worry about eating too much.⁴

Disease patterns also reflect the widening gap. The billion poorest suffer mostly from infectious diseases—malaria, tuberculosis, dysentery, and AIDS. Malnutrition leaves infants and small children even more vulnerable to such infectious diseases.

Unsafe drinking water takes a heavier toll on those with hunger-weakened immune systems, resulting in millions of fatalities each year. In contrast, among the billion at the top of the global economic scale, it is diseases related to aging and lifestyle excesses, including obesity, smoking, diets rich in fat and sugar, and exercise deprivation, that cause most deaths.⁵

Education levels reflect the deep divide between the rich and the poor. In some industrial countries—for example, Canada and Japan—more than half of all young people now graduate from college with either two- or four-year degrees. By contrast, in developing countries 115 million youngsters of elementary school age are not in school at all. Although five centuries have passed since Gutenberg invented the printing press, nearly 800 million adults are illiterate. Unable to read, they are also excluded from the use of computers and the Internet. Without adult literacy programs, their prospects of escaping poverty are not good.⁶

Close to 1 billion people live in countries where population size is essentially stable. But another billion or so live in countries where population is projected to double by 2050. The world's illiterates are concentrated in a handful of the more populous countries, most of them in Asia and Africa. Prominent among these are India, China, Pakistan, Bangladesh, Nigeria, Egypt, Indonesia, and Ethiopia, plus Brazil and Mexico in Latin America. From 1990 to 2000, China and Indonesia made large gains in reducing illiteracy. Other countries also making meaningful progress were Mexico, Nigeria, and Brazil. However, in four other populous countries—Bangladesh, Egypt, Pakistan, and India—the number of illiterates increased.⁷

Illiteracy and poverty tend to reinforce each other because illiterate women typically have much larger families than literate women do and because each year of schooling raises earning power by 10–20 percent. In Brazil, for instance, illiterate women have more than six children each on average; literate women have only two. Additionally, illiterate women are trapped by large families and minimal earning power.⁸

To be poor often means to be sick. As with illiteracy, poverty and ill health are closely linked. Health is closely related to access to safe water, something that 1.1 billion people lack. Waterborne diseases claim more than 3 million lives each year, mostly as a result of dysentery and cholera. These and other

waterborne diseases take their heaviest toll among children. Infant mortality in affluent societies averages 8 per 1,000 live births; in the 50 poorest countries, it averages 97 per 1,000—nearly 13 times as high.⁹

The poor and uneducated often do not understand the mechanisms of infectious disease transfer and thus fail to take steps to protect themselves. In addition, those with immune systems weakened by hunger are more vulnerable to common infectious diseases. Poverty also means children are often not vaccinated for routine infectious diseases, even though the cost may be just pennies per child.¹⁰

The connection between poverty and disease is strong, but it has been broken for most of humanity by economic development. The challenge now is to break this link for that remaining minority who do not have access to safe water, vaccines, education, and basic health care.

Hunger is the most visible face of poverty. The U.N. Food and Agriculture Organization estimates that 852 million of the world's people are chronically hungry. They are not getting enough food to achieve full physical and mental development and to maintain adequate levels of physical activity.¹¹

The majority of the underfed and underweight are concentrated in the Indian subcontinent and sub-Saharan Africa—regions that contain 1.4 billion and 750 million people, respectively. Twenty-five years ago, the nutritional status of Asia's population giants, India and China, was similar, but since then China has eliminated most of its hunger, whereas India has made limited progress. During this last quarter-century, China has accelerated the shift to smaller families. While gains in food production in India during this period were absorbed largely by population growth, those in China went mostly to raising individual consumption.¹²

Malnutrition takes its heaviest toll among the young, who are most vulnerable during their rapid physical and mental development. In both India and Bangladesh, almost half of all children under five are underweight and malnourished. In Ethiopia, 47 percent of children are undernourished, while in Nigeria the figure is 31 percent—and these are two of Africa's most populous countries.¹³

Although it is not surprising that those who are underfed

and underweight are concentrated in developing countries, it is perhaps surprising that most of them live in rural communities. More often than not, the undernourished are either landless or they live on plots of land so small that they are effectively landless. Those who live on the well-watered plains are usually better nourished. It is those who live on marginal land—land that is steeply sloping or semiarid—who are hungry.¹⁴

The penalties of being undernourished begin at birth. Gary Gardner and Brian Halweil of Worldwatch Institute cite a U.N. report that estimates 20 million underweight infants are born each year to mothers who also are malnourished. The study indicates that these children suffer lasting effects in the form of “impaired immune systems, neurological damage, and retarded physical growth.” David Barker of Britain’s University of Southampton observes soberly “that 60 percent of all newborns in India would be in intensive care had they been born in California.”¹⁵

Health Challenge Growing

Health challenges are becoming more numerous as new infectious diseases such as SARS, the West Nile virus, and avian flu emerge. In addition, the accumulation of chemical pollutants in the environment is starting to take a toll. While some infectious diseases, such as malaria and cholera, have been around a long time and are diseases with which health authorities are quite familiar, the health effects of many environmental pollutants are only now being determined.

Among the leading infectious diseases, malaria claims more than 1 million lives each year, 89 percent of them in Africa. The number who are infected, and often suffer from it most of their lives, is many times greater. Economist Jeffrey Sachs, head of Columbia University’s Earth Institute, estimates that reduced worker productivity and other costs associated with malaria are cutting economic growth by a full percentage point in countries with heavily infected populations.¹⁶

Although diseases such as malaria and cholera exact a heavy toll, there is no precedent for the number of lives affected by the HIV epidemic. To find anything similar to such a potentially devastating loss of life, we have to go back to the smallpox decimation of Native American communities in the sixteenth cen-

ture or to the bubonic plague that took roughly a fourth of Europe's population during the fourteenth century. HIV should be seen for what it is—an epidemic of epic proportions that, if not checked soon, could take more lives during this century than were claimed by all the wars of the last century.¹⁷

Since the human immunodeficiency virus was identified in 1981, this infection has spread worldwide. By 1990, an estimated 10 million people were infected with the virus. By the end of 2004, the number who had been infected climbed to 78 million. Of this total, 38 million have died; 39 million are living with the virus. Twenty-five million HIV-positive people today live in sub-Saharan Africa, but only 500,000 or so are being treated with anti-retroviral drugs. Seven million live in South and Southeast Asia, with over 5 million of them in India alone.¹⁸

Infection rates are climbing. In the absence of effective treatment, the parts of sub-Saharan Africa with the highest infection rates face a staggering loss of life. Adding the heavy mortality from the epidemic to the normal mortality of older adults means that countries like Botswana and Zimbabwe will lose half of their adult populations within a decade.¹⁹

The HIV epidemic is not an isolated phenomenon. It is affecting every facet of life and every sector of the economy. Food production per person, already lagging in most countries in sub-Saharan Africa, is now falling fast as the number of field workers shrinks. As food production falls, hunger intensifies among the dependent groups of children and the elderly. The downward spiral in family welfare typically begins when the first adult falls victim to the illness—a development that is doubly disruptive because for each person who is sick and unable to work, another adult must care for that person.²⁰

The massive loss of young adults to AIDS is already beginning to cut into economic activity. Rising worker health insurance costs in industry are shrinking or even eliminating company profit margins, forcing some firms into the red. In addition, companies are facing increased sick leave, decreased productivity, and the burden of recruiting and training replacements when employees die.²¹

Education is also affected. The ranks of teachers are being decimated by the virus. In 2001, for instance, Zambia lost 815 primary school teachers to AIDS, the equivalent of 45 percent of

new teachers trained that year. With students, when one or both parents die, more children are forced to stay home simply because there is not enough money to buy books and to pay school fees. Universities are also feeling the effects. At the University of Durbin in South Africa, for example, 25 percent of the student body is HIV-positive.²²

The effects on health care are equally devastating. In many hospitals in eastern and southern Africa, a majority of the beds are now occupied by AIDS victims, leaving less space for those with other illnesses. Already overworked doctors and nurses are often stretched to the breaking point. With health care systems now unable to provide even basic care, the toll of traditional disease is also rising. Life expectancy is dropping not only because of AIDS, but also because of the deterioration in health care.²³

The epidemic is leaving millions of orphans in its wake. Sub-Saharan Africa is expected to have 18.4 million “AIDS orphans” by 2010—children who have lost at least one parent to the disease. There is no precedent for millions of street children in Africa. The extended family, once capable of absorbing orphaned children, is now itself being decimated by the loss of adults, leaving children, often small ones, to take care of themselves. For some girls, the only option is what has come to be known as “survival sex.” Michael Grunwald of the *Washington Post* writes from Swaziland, “In the countryside, teenage Swazi girls are selling sex—and spreading HIV—for \$5 an encounter, exactly what it costs to hire oxen for a day of plowing.”²⁴

The HIV epidemic in Africa is now a development problem, a matter of whether a society can continue to function as needed to support its people. It is a food security problem. It is a national security problem. It is an educational system problem. And it is a foreign investment problem. Stephen Lewis, the U.N. Special Envoy for HIV/AIDS in Africa, says that the epidemic can be curbed and the infection trends can be reversed, but it will take help from the international community. The failure to fully fund the Global Fund to Fight AIDS, Tuberculosis and Malaria, he says, is “mass murder” by complacency.²⁵

Writing in the *New York Times*, Alex de Waal, an adviser to the U.N. Economic Commission for Africa and to UNICEF, sums up the effects of the epidemic well: “Just as HIV destroys the body’s immune system, the epidemic of HIV and AIDS has

disabled the body politic. As a result of HIV, the worst hit African countries have undergone a social breakdown that is now reaching a new level: African societies' capacity to resist famine is fast eroding. Hunger and disease have begun reinforcing each other. As daunting as the prospect is, we will have to fight them together, or we will succeed against neither."²⁶

While the HIV epidemic is currently concentrated in Africa, air and water pollutants are damaging the health of people everywhere. A joint study by the University of California and the Boston Medical Center shows some 200 human diseases, ranging from cerebral palsy to testicular atrophy, linked to pollutants. Other diseases that can be caused by pollutants include an astounding 37 forms of cancer, plus heart disease, kidney disease, high blood pressure, diabetes, dermatitis, bronchitis, hyperactivity, deafness, sperm damage, and Alzheimer's and Parkinson's diseases.²⁷

In July 2005, the Environmental Working Group in collaboration with Commonweal released an analysis of umbilical cord blood from 10 randomly selected newborns in U.S. hospitals. They detected a total of 287 chemicals in these tests. "Of the 287 chemicals we detected... we know that 180 cause cancer in humans or animals, 217 are toxic to the brain and nervous system, and 208 cause birth defects or abnormal development in animal tests." Everyone on the planet shares this "body burden" of toxic chemicals, but infants are at greater risk because they are in the highly vulnerable formative stage of early development.²⁸

WHO reports an estimated 3 million deaths worldwide each year from air pollutants—three times the number of traffic fatalities. A study in *Lancet* concluded that air pollution claims 40,000 lives per year in France, Austria, and Switzerland, half of them attributable to vehicle emissions. In the United States, air pollution each year claims 70,000 lives, nearly double the 40,000 traffic fatalities.²⁹

A U.K. research team reports a surprising rise in Alzheimer's and Parkinson's diseases and in motor neuron disease broadly in 10 industrial countries—six in Europe plus the United States, Japan, Canada, and Australia. In England and Wales, deaths from these brain diseases increased from 3,000 per year in the late 1970s to 10,000 in the late 1990s. Over an 18-year period, death rates from these dementias, mainly Alzheimer's, more

than tripled for men and nearly doubled for women. This increase in dementia is linked to a rise in the concentration of pesticides, industrial effluents, car exhaust, and other pollutants in the environment.³⁰

Horror stories of the health effects of uncontrolled industrial pollution in Russia are commonplace. For example, in the industrial town of Karabash in the foothills of the Ural Mountains, children routinely suffer from lead, arsenic, and cadmium poisoning. This translates into congenital defects, neurological disorders, and cancer. Pollutants also impair immune systems.³¹

Scientists are becoming increasingly concerned about the various effects of mercury, a potent neurotoxin, which now permeates the environment in virtually all countries with coal-burning power plants and many of those with gold mines. Gold miners release an estimated 200,000 pounds of mercury into the Amazon ecosystem each year, and coal-burning power plants release over 100,000 pounds of mercury into the air in the United States. The U.S. Environmental Protection Agency (EPA) reports that “mercury from power plants settles over water ways, polluting rivers and lakes, and contaminating fish.”³²

In 2004, 48 of the 50 states in the United States (all but Alaska and Wyoming) issued a total of 3,221 fish advisories warning against eating fish from local lakes and streams because of their mercury content. EPA research indicates that one out of every six women of childbearing age in the United States has enough mercury in her blood to harm a developing fetus. This means that 360,000 of the 4 million babies born in the country each year may face neurological damage from mercury exposure before birth. In a 2005 study by the Mt. Sinai Center for Children’s Health and the Environment, a team of doctors calculated that lower I.Q. levels as a result of mercury exposure in the womb cost the United States \$8.7 billion a year in lost earnings potential.³³

No one knows exactly how many chemicals are manufactured today, but with the advent of synthetic chemicals the number of chemicals in use has climbed to over 100,000. A random blood test of Americans will show measurable amounts of easily 200 chemicals that did not exist a century ago.³⁴

Most of these new chemicals have not been tested for toxicity. Those that are known to be toxic are included in a list of 667

chemicals whose discharge by industry into the environment must be reported to the EPA. The Toxic Release Inventory (TRI), now accessible on the Internet, also provides information on a community-by-community basis, arming local groups with data needed to evaluate the potential threats to their health and that of the environment. Since the TRI was inaugurated in 1988, reported toxic chemical emissions have declined steadily.³⁵

Although we have been hearing about the carcinogenic effects of pesticides since Rachel Carson launched the environmental era with her book *Silent Spring*, we are not yet adequately dealing with this threat. Since then we have learned a great deal about the health effects from chemicals released into the environment, particularly the endocrine disruptors described by Theo Colborn and her colleagues in *Our Stolen Future*. This family of chemicals disrupts the reproductive and developmental processes not only in humans but in many other species as well.³⁶

Throwaway Economy in Trouble

Another distinctly unhealthy economic trend has been the emergence over the last half-century of a throwaway economy. First conceived following World War II as a way of providing consumers with products, it soon came to be seen also as a vehicle for creating jobs and sustaining economic growth. The more goods produced and discarded, the reasoning went, the more jobs there would be.

What sold throwaways was their convenience. For example, rather than washing cloth towels or napkins, consumers welcomed disposable paper versions. Thus we have substituted facial tissues for handkerchiefs, disposable paper towels for hand towels, disposable table napkins for cloth ones, and throwaway beverage containers for refillable ones. Even the shopping bags we use to carry home throwaway products become part of the garbage flow.

This one-way economy depends on cheap energy. It is also facilitated by what are known in the United States as municipal solid waste management systems. Helen Spiegelman and Bill Sheehan of the Product Policy Institute write that these “have become a perverse public subsidy for the Throwaway Society. More and better waste management at public expense is giving

unlimited license to proliferate discards. Today these systems collect 3.4 pounds of product waste a day for each American man, woman, and child—twice as much as in 1960 and ten times as much as 100 years ago. It is time to revamp the system so that it no longer supports the throwaway habit.”³⁷

The throwaway economy is on a collision course with the earth’s geological limits. Aside from running out of landfills near cities, the world is also fast running out of the cheap oil that is used to manufacture and transport throwaway products. Perhaps more fundamentally, there is not enough readily accessible lead, tin, copper, iron ore, or bauxite to sustain the throwaway economy beyond another two or three generations. Assuming an annual 2-percent growth in extraction, U.S. Geological Survey data on current economically recoverable reserves show the world has 18 years of reserves remaining for lead, 20 years for tin, 25 years for copper, 64 years for iron ore, and 69 years for bauxite.³⁸

The cost of hauling garbage from cities is rising as nearby landfills fill up and the price of oil climbs. One of the first major cities to exhaust its locally available landfills was New York. When the Fresh Kills landfill, the local destination for New York’s garbage, was permanently closed in March 2001, the city found itself hauling garbage to landfill sites in New Jersey, Pennsylvania, and even Virginia—with some of the sites being 300 miles away.³⁹

Given the 12,000 tons of garbage produced each day in New York and assuming a load of 20 tons of garbage for each of the tractor-trailers used for the long-distance hauling, some 600 rigs are needed to move garbage from New York City daily. These tractor-trailers form a convoy nearly nine miles long—impeding traffic, polluting the air, and raising carbon emissions. This daily convoy led Deputy Mayor Joseph J. Lhota, who supervised the Fresh Kills shutdown, to observe that getting rid of the city’s trash is now “like a military-style operation on a daily basis.”⁴⁰

Fiscally strapped local communities in other states are willing to take New York’s garbage—if they are paid enough. Some see it as an economic bonanza. State governments, however, are saddled with increased road maintenance costs, traffic congestion, increased air pollution, noise, potential water pollution from landfill leakage, and complaints from nearby communities.

Virginia Governor Jim Gilmore wrote to Mayor Rudy Giuliani in 2001 complaining about the use of Virginia as a dumping ground. “I understand the problem New York faces,” he noted, “but the home state of Washington, Jefferson and Madison has no intention of becoming New York’s dumping ground.”⁴¹

Garbage travails are not limited to New York City. Toronto, Canada’s largest city, closed its last remaining landfill on December 31, 2002, and now ships all its 1.1-million-ton-per-year garbage to Wayne County, Michigan. Ironically, the state of New Jersey, the recipient of some of New York’s waste, is now shipping up to 1,000 tons of demolition debris 600 miles—also to Wayne County in Michigan.⁴²

The challenge is to replace the throwaway economy with a reduce-reuse-recycle economy. For cities like New York, the challenge should be less what to do with the garbage than how to avoid producing it in the first place.

Population and Resource Conflicts

As land and water become scarce, we can expect competition for these vital resources to intensify within societies, particularly between the wealthy and those who are poor and dispossessed. The shrinkage of life-supporting resources per person that comes with population growth is threatening to drop the living standards of millions of people below the survival level. This could lead to unmanageable social tensions that will translate into broad-based conflicts.⁴³

Access to land is a prime source of social tension. Expanding world population has cut the grainland per person in half, from 0.23 hectares in 1950 to 0.10 hectares in 2004. One tenth of a hectare is half of a building lot in an affluent U.S. suburb. This ongoing shrinkage of grainland per person makes it more difficult for the world’s farmers to feed adequately the 70 million or more people added each year.⁴⁴

The shrinkage in cropland per person not only threatens livelihoods; in largely subsistence societies, it threatens survival itself. Tensions within communities begin to build as landholdings shrink to an area smaller than that needed for survival. The Sahelian zone of Africa, with one of the world’s fastest-growing populations, is also an area of spreading conflict.⁴⁵

In troubled Sudan, 2 million people have died and over 4 million have been displaced in the long-standing conflict of more than 20 years between the Muslim north and the Christian south. The conflict in the Darfur region in western Sudan that began in 2003 illustrates the mounting tensions between two Muslim groups—Arab camel herders and black African subsistence farmers. Government troops are backing Arab militias, who are engaging in the wholesale slaughter of black Africans in an effort to drive them off their land, sending them into refugee camps in neighboring Chad. To date, some 140,000 people have been killed in the conflict and another 250,000 have died in the refugee camps of hunger and disease.⁴⁶

In Nigeria, where 132 million people are crammed into an area not much larger than Texas, overgrazing and overplowing are converting grassland and cropland into desert, putting farmers and herders in a war for survival. As Somini Sengupta reported in the *New York Times* in June 2004, “in recent years, as the desert has spread, trees have been felled and the populations of both herders and farmers have soared, the competition for land has only intensified.”⁴⁷

Unfortunately, the division between herders and farmers is also often the division between Muslims and Christians. The competition for land, amplified by religious differences and combined with a large number of frustrated young men with guns, has created what the *New York Times* described as a “combustible mix” that has “fueled a recent orgy of violence across this fertile central Nigerian state [Kebbi]. Churches and mosques were razed. Neighbor turned against neighbor. Reprisal attacks spread until finally, in mid-May, the government imposed emergency rule.”⁴⁸

Similar divisions exist between herders and farmers in northern Mali, the *New York Times* noted, where “swords and sticks have been chucked for Kalashnikovs, as desertification and population growth have stiffened the competition between the largely black African farmers and the ethnic Tuareg and Fulani herders. Tempers are raw on both sides. The dispute, after all, is over livelihood and even more, about a way of life.”⁴⁹

Rwanda has become a classic case study in how mounting population pressure can translate into political tension and conflict. James Gasana, who was Rwanda’s Minister of Agriculture

and Environment in 1990–92, offers some insights. As the chair of a national agricultural commission in 1990, he had warned that without “profound transformations in its agriculture, [Rwanda] will not be capable of feeding adequately its population under the present growth rate.” Although the country’s demographers projected major future gains in population, Gasana said in 1990 that he did not see how Rwanda would reach 10 million inhabitants without social disorder “unless important progress in agriculture, as well as other sectors of the economy, were achieved.”⁵⁰

Gasana’s warning of possible social disorder was prophetic. He further described how siblings inherited land from their parents and how, with an average of seven children per family, plots that were already small were fragmented further. Many farmers tried to find new land, moving onto steeply sloping mountains. By 1989, almost half of Rwanda’s cultivated land was on slopes of 10 to 35 degrees, land that is universally considered uncultivable.⁵¹

In 1950, Rwanda’s population was 2.4 million. By 1993, it was 7.5 million, making it the most densely populated country in Africa. As population grew, so did the demand for firewood. By 1991, the demand was more than double the sustainable yield of local forests. As trees disappeared, straw and other crop residues were used for cooking fuel. With less organic matter in the soil, land fertility declined.⁵²

As the health of the land deteriorated, so did that of the people dependent on it. Eventually there was simply not enough food to go around. A quiet desperation developed. Like a drought-afflicted countryside, it could be ignited with a single match. That match ignited with the crash of a plane on April 6, 1994, shot down as it approached the capital of Kigali, killing President Juvénal Habyarimana. The crash unleashed an organized attack by Hutus, leading to an estimated 800,000 deaths of Tutsis and moderate Hutus in 100 days. In some villages, whole families were slaughtered lest there be survivors to claim the family plot of land.⁵³

Many other African countries, largely rural in nature, are on a demographic track similar to Rwanda’s. Tanzania’s population of 38 million in 2005 is projected to increase to 67 million by 2050. Eritrea, where the average family has six children, is

projected to grow from 4 million to 11 million by 2050. In the Democratic Republic of the Congo, the population is projected to triple, going from 58 million to 177 million.⁵⁴

Africa is not alone. In India, tension between Hindus and Muslims is never far below the surface. As each successive generation further subdivides already small plots, pressure on the land is intense. The pressure on water resources is even greater.

With India's population projected to grow from 1.1 billion in 2005 to 1.6 billion in 2050, a collision between rising human numbers and shrinking water supplies seems inevitable. The risk is that India could face social conflicts that would dwarf those in Rwanda. As Gasana notes, the relationship between population and natural systems is a national security issue, one that can spawn conflicts along geographic, tribal, ethnic, or religious lines.⁵⁵

Disagreements over the allocation of water among countries that share river systems is a common source of international political conflict, especially where populations are outgrowing the flow of the river. Nowhere is this potential conflict more stark than among Egypt, Sudan, and Ethiopia in the Nile River valley. Agriculture in Egypt, where it rarely rains, is wholly dependent on water from the Nile. Egypt now gets the lion's share of the Nile's water, but its current population of 74 million is projected to reach 126 million by 2050, thus greatly expanding the demand for grain and for water. Sudan, whose 36 million people also depend heavily on food produced with Nile water, is expected to have 67 million by 2050. And the number of Ethiopians, in the country that controls 85 percent of the river's headwaters, is projected to expand from 77 million to 170 million.⁵⁶

Since there is already little water left in the Nile when it reaches the Mediterranean, if either Sudan or Ethiopia takes more water, Egypt will get less, making it increasingly difficult to feed an additional 52 million people. Although there is an existing water rights agreement among the three countries, Ethiopia receives only a minuscule share of water. Given its aspirations for a better life, and with the headwaters of the Nile being one of its few natural resources, Ethiopia will undoubtedly want to take more. With income per person averaging only \$860 a year in Ethiopia compared with nearly \$4,300 in Egypt, it is hard to argue that Ethiopia should not get more of the Nile water.⁵⁷

To the north, Turkey, Syria, and Iraq share the waters of the Tigris and Euphrates river system. Turkey, controlling the headwaters, is developing a massive project on the Tigris to increase the water available for irrigation and power. Syria and Iraq, which are both projected to double their respective populations of 19 million and 29 million, are concerned because they too will need more water.⁵⁸

In the Aral Sea basin in Central Asia, there is an uneasy arrangement among five countries over the sharing of the two rivers, the Amu Darya and the Syr Darya, that drain into the sea. The demand for water in Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan already exceeds the flow of the two rivers by 25 percent. (See Chapter 3.) Turkmenistan, which is upstream on the Amu Darya, is planning to develop another half-million hectares of irrigated agriculture. Racked by insurgencies, the region lacks the cooperation needed to manage its scarce water resources. On top of this, Afghanistan, which controls the headwaters of the Amu Darya, plans to use some of the water for its development. Geographer Sarah O'Hara of the University of Nottingham, who studies the region's water problems, says, "We talk about the developing world and the developed world, but this is the deteriorating world."⁵⁹

Environmental Refugees on the Rise

As natural systems deteriorate, people are forced to migrate, sometimes to other countries. In mid-October 2003, Italian authorities discovered a boat carrying refugees from Africa bound for Italy. Adrift for more than two weeks and without fuel, food, and water, many of the passengers had died. At first the dead were tossed overboard. But after a point, the remaining survivors lacked the strength to hoist the bodies over the side. The dead and the living sharing the boat resembled what a rescuer described as "a scene from Dante's *Inferno*."⁶⁰

The refugees were believed to be Somalis who had embarked from Libya, but they would not reveal their country of origin. We do not know whether they were political, economic, or environmental refugees. Failed states like Somalia produce all three. We do know that Somalia is an ecological basket case, with overpopulation, overgrazing, and desertification already destroying its pastoral economy.⁶¹

For Central American countries, including Honduras, Guatemala, Nicaragua, and El Salvador, Mexico is often the gateway to the United States. In 2003, Mexican authorities arrested and deported some 147,000 illegal immigrants, up from roughly 120,000 the previous year.⁶²

In the city of Tapachula on the Guatemala-Mexico border, young men in search of jobs wait along the tracks for a slow-moving freight train moving through the city en route to the north. Some make it onto the train. Others do not. The Jesús el Buen Pastor refuge is home to 25 amputees who lost their grip and fell under the train while trying to board. For these young men, says Olga Sánchez Martínez, the director of the refuge, this is the “end of their American dream.” A local priest, Flor María Rigoni, calls the migrants attempting to board the trains “the kamikazes of poverty.”⁶³

Environmental refugees also flow to the United States from Haiti, a widely recognized ecological disaster. In a rural economy where the land is stripped of vegetation and the soil is washing into the sea, the people are not far behind. Many drown in rough waters when attempting to make the trip to Florida in small craft not designed for the high seas.⁶⁴

Today, bodies washing ashore in Italy, Spain, and Turkey are a daily occurrence, the result of desperate acts by desperate people. And each day Mexicans risk their lives in the Arizona desert trying to reach jobs in the United States. Some 400 to 600 Mexicans leave rural areas every day, abandoning plots of land too small or too eroded to make a living. They either head for Mexican cities or try to cross illegally into the United States. Many of those who try to cross the Arizona desert perish in its punishing heat—scores of bodies are found along the Arizona border each year.⁶⁵

Although the modern world has extensive experience with political and economic refugees, we are now seeing a swelling flow of refugees driven from their homes by environmental pressures. This harkens back to the Dust Bowl era some 70 years ago, when nearly 3 million Americans were displaced.⁶⁶

The United States is again contending with environmental refugees but now for different reasons. In Alaska, where the temperature rise in recent decades of 2–4 degrees Celsius (4–7 degrees Fahrenheit) is perhaps as great as anywhere in the

world, thousands of indigenous peoples will almost certainly be forced to evacuate their villages as a result of ice melting and flooding. Newtok, a village of 340 Yupik Eskimos on Alaska's west coast, is being overrun by a swelling torrent of ice melt water from the Ninglick River. An engineering study estimated the cost of relocating the village at a minimum of \$50 million—or \$150,000 per villager. If the Newtok Indians do not move, they risk drowning in the floodwater. Although relocating villages is not a simple matter, there are 23 other Alaskan villages waiting to be relocated.⁶⁷

With the vast majority of the nearly 3 billion people to be added to the world by 2050 living in countries where water tables are already falling, water refugees are likely to become commonplace. They will be most common in arid and semiarid regions where populations are outgrowing the water supply and sinking into hydrological poverty. Villages in northwestern India are being abandoned as aquifers are depleted and people can no longer find water. Millions of villagers in northern and western China and in parts of Mexico may have to move because of a lack of water.⁶⁸

Advancing deserts are also displacing people, squeezing expanding populations into an ever smaller geographic area. Whereas the U.S. Dust Bowl displaced a few million people, the abandonment or partial depopulation of 24,000 villages in China's dust bowl provinces is displacing tens of millions.⁶⁹

In Iran, villages abandoned because of spreading deserts or a lack of water already number in the thousands. In the vicinity of Damavand, a small town within an hour's drive of Tehran, 88 villages have been abandoned. And as the desert takes over in Nigeria, farmers and herders are forced to move, squeezed into a shrinking area of productive land. Desertification refugees typically end up in cities, many in squatter settlements. Many more migrate abroad.⁷⁰

Another upcoming source of refugees, potentially a huge one, is rising seas. The largest potential displacement would come in low-lying Bangladesh, where even a 1-meter rise in sea level would not only inundate half of the country's riceland but would also force the relocation of easily 40 million people. In a densely populated country with 142 million people, internal relocation would not be easy. But where else can they go? How

many countries would accept even a million Bangladeshi refugees displaced by rising sea level? Other Asian countries with rice-growing river deltas and floodplains, including China, India, Indonesia, Pakistan, the Philippines, South Korea, Thailand, and Viet Nam, could also suffer a mass exodus from rising seas.⁷¹

The refugee flows from falling water tables and expanding deserts are just beginning. How large these flows and those from rising seas will become remains to be seen. But the numbers could be huge, offering yet another reason for stabilizing climate and population.

Failed States and Terrorism

After a half-century of forming new states from former colonies and from the breakup of the Soviet Union, the international community is now focusing on the disintegration of states. The term “failed states” is now part of our working vocabulary, describing countries where there is no longer a central government. As one study observes, “Failed states have made a remarkable odyssey from the periphery to the very center of global politics.”⁷²

Recognizing this increasingly common phenomenon, various groups concerned with economic development and international affairs have begun to identify failing or failed states and the indicators associated with their failure. The World Bank, for example, has constructed a list of 30 “low-income countries under stress.” Motivated by a similar concern, the United Kingdom’s Department for International Development has identified 46 “fragile” states. The U.S. Central Intelligence Agency has constructed a list of 20 failing states. Most recently, the Fund for Peace and the Carnegie Endowment for International Peace have worked together to identify a list of 60 states, ranking them according to “their vulnerability to violent internal conflict.”⁷³

This analysis, published in *Foreign Policy*, is based on 12 social, economic, political, and military indicators. It puts Côte d’Ivoire at the top of the list of failed states, followed by the Democratic Republic of the Congo, Sudan, Iraq, Somalia, Sierra Leone, Chad, Yemen, Liberia, and Haiti. Next in line are three countries that have been much in the news in recent years: Afghanistan, Rwanda, and North Korea.⁷⁴

Five oil-exporting countries make the top 60 list, including the two largest exporters and producers—Saudi Arabia (forty-fifth on the list) and Russia (fifty-ninth)—plus Venezuela (twenty-first), Indonesia (forty-sixth), and Nigeria (fifty-fourth). Two countries with nuclear arsenals are also on the list: Pakistan and Russia.⁷⁵

The three top indicators used in constructing the *Foreign Policy* scorecard are uneven development, the loss of governmental legitimacy, and demographic pressure. Uneven development typically means that a small segment of the population is accumulating wealth while much of the society may be suffering a decline in living conditions. This unevenness, often associated with political corruption, creates unrest and can lead to civil conflict.⁷⁶

Governments that fail to effectively manage emerging issues and provide basic services are seen as useless. This often causes segments of the population to shift their allegiance to warlords, tribal chieftains, or religious leaders. A loss of political legitimacy is an early sign of state decline.⁷⁷

The third top indicator is demographic pressure. All the countries in the top 20 on the *Foreign Policy* list have fast-growing populations. In many that have experienced rapid population growth for several decades, governments are suffering from demographic fatigue, unable to cope with the steady shrinkage in per capita cropland and fresh water supplies or to build schools fast enough for the swelling ranks of children.⁷⁸

Foreign investment drying up and a resultant rise in unemployment are also part of the decline syndrome. An earlier study by Population Action International showed that one of the key indicators of political instability in a society is the number of unemployed young men, a number that is high in countries at the top of the *Foreign Policy* article list.⁷⁹

Another characteristic of failing states is a deterioration of the physical infrastructure—roads and power, water, and sewage systems. Care for natural systems is also neglected as people struggle to survive. Forests, grasslands, and croplands deteriorate, creating a downward economic spiral.⁸⁰

Among the most conspicuous indications of state failure is a breakdown in law and order and a related loss of personal security. In Haiti, armed gangs rule the streets. Kidnapping for ransom of local people who are lucky enough to be among the 30

percent of the labor force that is employed is commonplace. In Afghanistan it is the local warlords, not the central government, that control the country outside of Kabul. Somalia, which now exists only on maps, is ruled by tribal leaders, each claiming a piece of what was once a country.⁸¹

Some of these countries are involved in long-standing civil conflicts. The Democratic Republic of the Congo, occupying a large part of the Congo River basin in the heart of Africa, has been the site of an ongoing civil conflict for six years, a conflict that has claimed 3.8 million lives and driven millions more from their homes. According to the International Rescue Committee, for each violent death in this conflict there are 62 nonviolent deaths related to it, including deaths from hunger, respiratory illnesses, diarrhea, and other diseases.⁸²

Some potential sources of instability are taking the world into uncharted territory. In sub-Saharan Africa, where HIV infection rates sometimes exceed 30 percent of all adults, there will be millions of orphans in the years ahead, as noted earlier. With the number of orphans overwhelming society's capacity to care for them, many will become street children. Growing up without parental guidance and appropriate role models, and with their behavior shaped by the desperation of survival, these orphans will become a new threat to stability and progress.⁸³

Failing states are of growing international concern because they are a source of terrorists, drugs, weapons, and refugees. Not only was Afghanistan a training ground for terrorists, but it quickly became, under the Allied occupation, the world's leading supplier of heroin. Refugees from Rwanda, including thousands of armed soldiers, contributed to the destabilization of the Congo. As *The Economist* notes, "Like a severely disturbed individual, a failed state is a danger not just to itself, but to those around it and beyond."⁸⁴

In many countries, the United Nations or other internationally organized peacekeeping forces are trying to keep the peace, often unsuccessfully. Among the countries with U.N. peacekeeping forces are the Democratic Republic of the Congo, Sierra Leone, and Liberia. Other countries with multinational peacekeeping forces include Afghanistan, Haiti, and Sudan. All too often these are token forces, not nearly large enough to assure stability.⁸⁵

Countries like Haiti and Afghanistan are surviving today because they are on international life-support systems. Economic assistance—including, it is worth noting, food aid—is helping to sustain them. But there is not now enough assistance to overcome the reinforcing trends of deterioration and replace them with state stability and sustained economic progress.⁸⁶