"A landmark... [Sachs's] book combines his practical experience with sharp professional analysis and clear exposition... Writing in a straightforward but engaging first person, Sachs keeps his tone even whether discussing failed states or thriving ones... If there is any one work to put extreme poverty back onto the global agenda, this is it."

—Publishers Weekly (starred boxed review)

"Eminently practical, minimally pipe-dreamy... a solid, reasonable argument in which the dismal science offers a brightening prospect for the world's poor."

—Kirkus Reviews

"This is an excellent, understandable book on a critical topic and should be required reading for students and participants in public policy as well as those who doubt the problem of world poverty can be solved."

—Booklist

"Yes, Jeff Sachs is a dreamer, but one whose dreams flow not only from idealism but also from good analysis and impressive experience. If you care about development, and more importantly about poor people in the developing world, this volume is a must."

—Ernesto Zedillo

"Professor Sachs has provided a compelling blueprint for eliminating extreme poverty from the world by 2025. Sachs's analysis and proposals are suffused with all the practical experience of his twenty years in the field—working in dozens of countries across the globe to foster economic development and well-being."

—George Soros

"Jeff Sachs addresses crucial challenges to us all: He speaks to our hearts and minds—from his wide experience of an interconnected world. His is a convincing voice of reason and promise."

—Gro Harlem-Brundtland

"Recent developments in modern science and technology and the application of these through appropriate institutional mechanisms have provided us with the hope that chronic poverty need not be the inevitable lot of a majority of the human race. It is for all of us to find creative ways and means through social engineering to realize the potential that is available to us. Poverty eradication is a feasible and realistic goal. The primary responsibility must lie with the people and governments of developing countries. However, international cooperation can play an effective role in poverty reduction by providing the necessary technical and financial support for managing this process at a rapid pace. This book by professor Jeffrey Sachs provides a deep insight into the success achieved in this regard in many developing countries and provides useful lessons for all practitioners of policy making for poverty eradication and economic development. The insights are incisive and are placed in the larger global context of economic change and enable readers to convert these into effective policy instruments."

—Prime Minister of India Manmohan Singh

THE END

of

POVERTY

Economic Possibilities for Our Time

JEFFREY D. SACHS

PENGUIN BOOKS
THE SPREAD OF ECONOMIC PROSPERITY

The move from universal poverty to varying degrees of prosperity has happened rapidly in the span of human history. Two hundred years ago the idea that we could potentially achieve the end of extreme poverty would have been unimaginable. Just about everybody was poor, with the exception of a very small minority of rulers and large landowners. Life was as difficult in much of Europe as it was in India or China. Our great-great-grandparents were, with very few exceptions, most likely poor and living on a farm. One leading economic historian, Angus Maddison, puts the average income per person in Western Europe in 1820 at around 90 percent of the average income of Africa today. Life expectancy in Western Europe and Japan as of 1800 was about forty years.

A few centuries ago, vast divides in wealth and poverty around the world did not exist. China, India, Europe, and Japan all had similar income levels at the time of European discoveries of the sea routes to Asia, Africa, and the Americas. Marco Polo marveled at the sumptuous wonders of China, not at its poverty. Cortés and his conquistadores expressed astonishment at the riches of Tenochtitlán, the capital of the Aztecs. The early Portuguese explorers were impressed with the well-ordered towns of West Africa.

THE NOVELTY OF MODERN ECONOMIC GROWTH

If we are to understand why a vast gap between rich and poor exists today, we must return to the very recent period of human history when this divide emerged. The past two centuries, since around 1800, constitute a unique era in economic history, a period the great economic historian Simon Kuznets famously termed the period of modern economic growth. Before then, indeed for thousands of years, there had been virtually no sustained economic growth in the world, and only gradual increases in the human population. The world population had risen gradually from around 230 million people at the start of the first millennium in A.D. 1, to perhaps 270 million by A.D. 1000, and 900 million people by A.D. 1800. Real living standards were even slower to change. According to Maddison, there was no discernible rise in living standards on a global scale during the first millennium, and perhaps a 50 percent increase in per capita income in the eight-hundred-year period from A.D. 1000 to A.D. 1800.

In the period of modern economic growth, however, both population and per capita income came unstuck, soaring at rates never before seen or even imagined. As shown on figure 1, the global population rose more than sixfold in just two centuries, reaching an astounding 6.1 bil-

![Figure 1: World Population](source: Data from Maddison (2001))
lion people at the start of the third millennium, with plenty of momentum for rapid population growth still ahead. The world's average per capita income rose even faster, shown in figure 2, increasing by around nine times between 1820 and 2000. In today's rich countries, the economic growth was even more astounding. The U.S. per capita income increased almost twenty-five-fold during this period, and Western Europe's increased fifteen-fold. Total worldwide food production more than kept up with the booming world population (though large numbers of chronically hungry people remain until today). Vastly improved farm yields were achieved on the basis of technological advances. If we combine the increases in world population and world output per person, we find an astounding forty-ninefold increase in total economic activity in the world (the gross world product, or GWP) over the past 180 years.

Figure 2: World Average per Capita Income

[Graph showing world average per capita income with years on the x-axis and income on the y-axis.]

Source: Data from Maddison (2001).

The gulf between today's rich and poor countries is therefore a new phenomenon, a yawning gap that opened during the period of modern economic growth. As of 1820, the biggest gap between the rich and poor—specifically, between the world's leading economy of the day, the United Kingdom, and the world's poorest region, Africa—was a ratio of four to one in per capita income (even after adjusting for differences in purchasing power). By 1998, the gap between the richest economy, the United States, and the poorest region, Africa, had widened to twenty to one. Since all parts of the world had a roughly comparable starting point in 1820 (all very poor by current standards), today's vast inequalities reflect the fact that some parts of the world achieved modern economic growth while others did not. Today's vast income inequalities illuminate two centuries of highly uneven patterns of economic growth.

Figure 3: GDP per Capita by Region in 1820 and 1998

[Graph showing GDP per capita by region with years on the x-axis and income on the y-axis.]

Source: Data from Maddison (2001): average annual growth rate in parentheses.

This inequality is evident in the bar chart in figure 3. The height of the first bar indicates the level of per capita income in 1820, and the second in 1998, using Maddison's estimates. The number in parentheses at the top of the second bar is the average annual growth rate of the region (between 1820 and 1998). Three main points stand out:

- All regions were poor in 1820
- All regions experienced economic progress
- Today's rich regions experienced by far the greatest economic progress
What do I mean by “highly uneven” economic growth across regions between 1820 and 1998? Even small differences in annual economic growth rates, if sustained for decades or centuries, eventually lead to huge differences in the levels of economic well-being (as measured here by the average per capita income in a society). The per capita gross national product of the United States, for example, grew at an annual rate of around 1.7 percent per year during the period 1820 to 1998. This led to a twenty-five-fold increase in living standards, with per capita incomes rising from around $1,200 per person in 1820 to around $30,000 today (in 1990 dollars). The key for the United States to become the world’s richest major economy was not spectacularly fast growth, such as China’s recent achievement of 8 percent growth per year, but rather steady growth at a much more modest 1.7 percent per year. The key was consistency, the fact that the United States maintained that income growth rate for almost two centuries.

By contrast, the economies of Africa have grown at an average of 0.7 percent per year. This difference may not seem like much compared with 1.7 percent per year in the United States, but over a period of 180 years a small difference in annual growth leads to huge differences in income levels. With growth of 0.7 percent per annum, Africa’s initial income (roughly $400 per capita) increased by little more than three-fold, to roughly $1,300 per capita as of the year 1998, compared with an almost twenty-five-fold increase in the United States. Today’s twenty-fold gap in income between the United States and Africa, therefore, results from a three-fold gap as of 1820, which was magnified seven times by the difference in annual growth rates of 1.7 percent in the United States versus 0.7 percent in Africa.

The crucial puzzle for understanding today’s vast inequalities, therefore, is to understand why different regions of the world have grown at different rates during the period of modern economic growth. Every region began the period in extreme poverty. Only one sixth of the world’s population achieved high-income status through consistent economic growth. Another two thirds have risen to middle-income status with more modest rates of economic growth. One sixth of humanity is stuck in extreme poverty, with very low rates of economic growth during the whole period. First we must understand why growth rates differ over long periods of time so that we can identify the key ways to raise economic growth in today’s lagging regions.

Let me dispose of one idea right from the start. Many people assume that the rich have gotten rich because the poor have gotten poor. In other words, they assume that Europe and the United States used military force and political strength during and after the era of colonialism to extract wealth from the poorest regions, and thereby to grow rich. This interpretation of events would be plausible if gross world product had remained roughly constant, with a rising share going to the powerful regions and a declining share going to the poorer regions. However, that is not at all what happened. Gross world product rose nearly fifty-fold. Every region of the world experienced some economic growth (both in terms of the overall size of the economy, and even when measured per person), but some regions experienced much more growth than others. The key fact of modern times is not the transfer of income from one region to another, by force or otherwise, but rather the overall increase in world income, but at a different rate in different regions.

This is not to say that the rich are innocent of the charge of having exploited the poor. They surely have, and the poor countries continue to suffer as a result in countless ways, including chronic problems of political instability. However, the real story of modern economic growth has been the ability of some regions to achieve unprecedented long-term increases in total production to levels never before seen in the world, while other regions stagnated, at least by comparison. Technology has been the main force behind the long-term increases in income in the rich world, not exploitation of the poor. That news is very good indeed because it suggests that all of the world, including today’s lagging regions, has a reasonable hope of reaping the benefits of technological advance. Economic development is not a zero-sum game in which the winnings of some are inevitably mirrored by the losses of others. This game is one that everybody can win.

On the Eve of Takeoff

Until the mid-1700s, the world was remarkably poor by any of today’s standards. Life expectancy was extremely low; children died in vast numbers in the now rich countries as well as the poor countries. Many waves of disease and epidemics, from the black death of Europe to smallpox and measles, regularly washed through society and killed mass numbers of people. Episodes of hunger and extreme weather and cli-
mante fluctuations sent societies crashing. The rise and fall of the Roman Empire, for famed twentieth-century historian Arnold Toynbee, was much like the rise and decline of all other civilizations before and since. Economic history had long been one of ups and downs, with growth followed by decline rather than sustained economic progress.

John Maynard Keynes wrote about this virtual stagnation of human economic progress in his 1930 essay on the Economic Possibilities for Our Grandchildren:

From the earliest times from which we have record, that, say, the two thousand years before Christ, down to the beginning of the eighteenth century, there was no really great change in the standard of living of the average man living in the civilized centers of the earth. Ups and downs, certainly visitations of plague, famine and war, golden intervals, but no progressive violent change. Some periods perhaps fifty percent better than others, at the utmost a hundred percent better in the four thousand years that ended, say, in A.D. 1700.

He also pinpointed technology as the reason for this long-term stasis:

The absence of important technological inventions between the prehistoric age and comparatively modern times is truly remarkable. Almost everything which really matters, and which the world possessed at the commencement of the modern age, was already known to man at the dawn of history: language, fire, the same domestic animals which we have today, wheat, barley, the vine and the olive, the plow and the wheel, the car, the sail, leather, linen and cloth, bricks and pots, gold and silver, copper, tin, and lead—and iron was added to the list before one thousand B.C.—banking, statecraft, mathematics, astronomy, and religion. There is no record when we first possessed these . . .

What changed was the onset of the Industrial Revolution, supported by a rise in agricultural productivity in northwestern Europe. Food yields rose with systematic improvements in agronomic practice, including the management of soil nutrients through improved crop rotations. The dramatic breakthrough came in England around 1750, when Britain’s nascent industry first mobilized new forms of energy for production at scales that had never before been achieved. The steam engine marked the decisive turning point of modern history. By mobilizing a vast store of primary energy, fossil fuels, the steam engine unlocked the mass production of goods and services on a scale beyond the wildest dreams of the preindustrial era. Modern energy fueled every aspect of the economic takeoff. Food production soared as fossil fuel energy was used to produce chemical fertilizers; industrial production skyrocketed as vast inputs of fossil fuel energy created equally vast powerhouses of steel, transport equipment, chemicals and pharmaceuticals, textile and apparels, and every other modern manufacturing sector. By the early twentieth century, the service industries, including modern information and communications technologies, were powered by electrification, itself a breakthrough of the fossil-fuel age.

As coal fueled industry, so, too, industry fueled political power. The British Empire became the global political manifestation of the Industrial Revolution. Britain’s industrial breakthrough, unique in the world as of the early nineteenth century, created a huge military and financial advantage that allowed Britain to expand its control over one sixth of humanity at the peak of the empire during the Victorian era.

Why was Britain first? Why not China, which was the world’s technological leader for about a thousand years, between A.D. 500 and A.D. 1500? Why not other centers of power on the European continent or in Asia? This question is much debated among economic historians, but a few good answers are evident, and they provide clues to the deeper underpinnings of the Industrial Revolution.

First, British society was relatively open, with more scope for individual initiative and social mobility than most other societies of the world. The fixed social orders of the feudal era had weakened enormously or disappeared entirely by 1500, at a time when serfdom was still the rule through much of Europe. Even more rigid social hierarchies, such as India’s caste system, were common in other parts of the world.

Second, Britain had strengthening institutions of political liberty. Britain’s parliament and its traditions of free speech and open debate were powerful contributors to the uptake of new ideas. They were also increasingly powerful protectors of private property rights, which in turn underpinned individual initiative.

Third, and critically, Britain became one of the leading centers of Europe’s scientific revolution. After centuries in which Europe was mainly the importer of scientific ideas from Asia, European science
made pivotal advances beginning in the Renaissance. Modern physics emerged from the astronomical discoveries of Copernicus, Brahe, Kepler, and Galileo. With Britain's political openness, speculative scientific thinking was given opportunity to thrive, and the scientific advances on the Continent stimulated an explosion of scientific discovery in England. The decisive breakthrough came with Isaac Newton's *Principia Mathematica* in 1687, one of the most important books ever written. By showing that physical phenomena could be described by mathematical laws, and by providing the tools of calculus to discover those laws, Newton set the stage for hundreds of years of scientific and technological discovery, and for the Industrial Revolution that would follow the scientific revolution.

Fourth, Britain had several crucial geographical advantages. First, as an island economy close to continental Europe, Britain enjoyed low-cost sea-based trade with all parts of Europe. Britain also had extensive navigable river ways for internal trade and enjoyed a highly favorable environment for agriculture, with a combination of plentiful rainfall, an ample growing season, and good soils. Another crucial geographical advantage was Britain's proximity to North America. The new settlements in North America provided vast new territories for food production and raw materials such as cotton for British industry, and they were the safety valve that facilitated the exodus of impoverished people from the British countryside. As England's own agricultural productivity grew, with more food produced by fewer people, millions of landless poor went to North America.

In his seminal 1776 work, *The Wealth of Nations*, Adam Smith referred to Britain's natural advantages:

> England, on account of the natural fertility of the soil, of the great extent of the sea-coast in proportion to that of the whole country, and of the many navigable rivers which run through it and afford the conveniency of water carriage to some of the most inland parts of it, is perhaps as well fitted by nature as any large country in Europe to be the seat of foreign commerce, of manufactures for distant sale and of all the improvements which these can occasion.

Fifth, Britain remained sovereign and faced lesser risk of invasion than its neighbors. Being an island helped considerably, much the same way that Japan's insular geography allowed it to escape invasion despite numerous attempts from the Asian mainland. Indeed, with a one-century lag, Japan was to play a role similar to Britain's as the leader of Asia's takeoff to modern economic growth on the other side of the Eurasian land mass.

Sixth, Britain had coal, and with the invention of the steam engine, coal freed society from energy constraints that had limited the scale of economic production throughout human history. Before coal, economic production was limited by energy inputs, almost all of which depended on the production of biomass: food for humans and farm animals and fuel wood for heating and certain industrial processes. Wind power could also be harnessed for sea transport, and wind and water power could be harnessed for some industrial processes. None of these energy sources, however, could unleash the potential for mass production that coal did.

Britain's advantages, in summary, were marked by a combination of social, political, and geographical factors. British society was relatively free and politically stable. Scientific thinking was dynamic. Geography enabled Britain to benefit from trade, productive agriculture, and energy resources in vast stocks of coal. Other parts of the world were not as fortunate to have this confluence of favorable factors. Their entry into modern economic growth would be delayed. In the most disadvantaged environments, modern economic growth has been delayed until today.

The Great Transformation

The combination of new industrial technologies, coal power, and market forces created the Industrial Revolution. The Industrial Revolution, in turn, led to the most revolutionary economic events in human history since the start of agriculture ten thousand years earlier. Suddenly, economies could grow beyond long-acclimated bounds without hitting the biological constraints of food and timber production. Industrial production grew rapidly, and the power of economic growth spilled out from Great Britain to all parts of the world. Societies the world over were fundamentally changed, often tumultuously.

The Industrial Revolution, and the modern economic growth that followed, has changed the way people live in every fundamental sense: where and how they live, what kind of work or economic activity they perform, how they form families. In Britain first, and then elsewhere, industrialization meant a shift of people from overwhelmingly agrarian activities to industrial activities, giving rise to urbanization, social mobil-
ity, new gender and family roles, a demographic transition, and specialization in labor.

Modern economic growth is accompanied first and foremost by urbanization, that is, by a rising share of a nation’s population living in urban areas. There are two basic reasons why economic growth and urbanization go hand in hand. The first is rising agricultural productivity. As food production per farmer rises, an economy needs fewer and fewer farmers to feed the overall population. As food production per farmer rises, food prices fall, inducing farmers and especially their children to seek employment in nonfarm activities. The second is the advantage of high-density urban life for most nonfarm economic activities, especially the face-to-face demands of commerce and other parts of the service sector. Sparsely populated rural areas make good economic sense when each household needs a lot of land for farm production. But they make little sense when people are engaged mainly in manufacturing, finance, commerce, and the like. Once the labor force is no longer engaged mainly in food production, it is natural that the bulk of the population will relocate to cities, drawn by higher wages that in turn reflect the higher productivity of work in densely settled urban areas.

Modern economic growth has also produced a revolution in social mobility. Established social rankings—such as the fixed hierarchical divisions between peasants and gentry, or within the Indian caste structure, or in the social orders of nobility, priests, merchants, and farmers that characterized many traditional Asian societies—all unravel under the forces of market-based modern economic growth. Fixed social orders depend on a static and largely agrarian economic setting where little changes in living standards or technologies from one generation to the next. They cannot withstand the sudden and dramatic bursts of technological change that occur during modern economic growth, in which occupations and social roles shift dramatically from one generation to the next, rather than being inherited by sons from fathers and daughters from mothers.

One aspect of changing social mobility requires special note, the change in gender roles. Traditional societies tend to be strongly differentiated in gender roles, with women almost always getting the short end of the deal. In settings where the total fertility rate—the average number of children per woman—is typically at least five, and often much higher, women spend most of their adult lives rearing children. Traditionally homebound, women live lives of back-breaking labor on the farm, endless walking to collect fuel wood and water, and child rearing. With modern economic growth, this dynamic changes. Women can avail themselves of urban-based employment, as in the case of the young women in the apparel factories of Dhaka, leading them ultimately toward social and political empowerment.

The changes in living conditions and economic activities lead to new realities in family structure as well. The age of marriage is typically delayed, and sexual relations are transformed, with greater sexual freedom much less directly linked to child rearing. Fewer generations of family members live under one roof. And crucially, the desired number of children changes remarkably as families move from rural to urban settings. In rural societies, large families are almost always the norm. In urban societies, families choose to have fewer children. This is the crux of the demographic transition, one of the most fundamental of all social changes during the era of modern economic growth.

One more crucial element occurs with deep structural change: the division of labor increases, as people become more and more specialized in their skills. The talents of a poor rural farmer in Africa today, or in Scotland at the time of Adam Smith, are truly marvelous. These farmers typically know how to build their own houses, grow and cook food, tend to animals, and make their own clothing. They are, therefore, construction workers, veterinarians and agronomists, and apparel manufacturers. They do it all, and their abilities are deeply impressive.

They are also deeply inefficient. Adam Smith pointed out that specialization, where each of us learns just one of those skills, leads to a general improvement of everybody’s well-being. The idea is simple and powerful. By specializing in just one activity—such as food raising, clothing production, or home construction—each worker gains mastery over the particular activity. Specialization makes sense, however, only if the specialist can subsequently trade his or her output with the output of specialists in other lines of activity. It would make no sense to produce more food than a household needs unless there is a market outlet to trade that excess food for clothing, shelter, and so forth. At the same time, without the ability to buy food on the market, it would not be possible to be a specialist home builder or clothing maker, since it would be necessary to farm for one’s own survival. Thus Smith realized that the division of labor is limited by the extent of the market (that is,
by the ability to trade), whereas the extent of the market is determined by the degree of specialization (and hence, productivity).

**THE SPREAD OF MODERN ECONOMIC GROWTH**

Modern economic growth first emerged in England because of the confluence of favorable conditions. However, these conditions were not unique to England, and once the Industrial Revolution was under way, the same combination of modern technologies and social organization could spread to other parts of the world. What started in one corner of Northern Europe would eventually reach almost the entire planet. In doing so, the forces of modern economic growth propelled a general increase in global production of unprecedented dimensions.

On paper, the transition to modern economic growth might appear to be an unambiguous and straightforward benefit for the world. After all, new technologies enabled society to harness energy and ideas that raised labor productivity (economic output per person) to levels never before imagined. This productivity brought about a rise in living standards of unprecedented scale. Yet the transition was more tumultuous than not, involving vast social struggles and often war. Before turning to the historical record, it is worth considering for a moment why the transition was so difficult in so many places.

Most important, modern economic growth was not only a question of "more" (output per person) but also "change." The transition to modern economic growth involved urbanization, changing gender roles, increased social mobility, changing family structure, and increasing specialization. These were difficult transitions, involving multiple upheavals in social organization and in cultural beliefs. In addition, the spread of modern economic growth was also marked by a systematic and repeated confrontation between the world's newly rich countries and the world's still poor countries. Since modern economic growth occurred at such different rates in different places, it created an extent of inequality of global wealth and power that was unique in human history. Britain's industrial dominance—the result of Britain's lead in industrialization—gave it a unique military dominance as well, which in turn converted to empire. More generally, Europe's early industrialization in the nineteenth century ended up fueling a vast European empire throughout Asia, Africa, and the Americas.

Finally, the vast differences in power contributed to faulty social theories of these differences that are still with us today. When a society is economically dominant, it is easy for its members to assume that such dominance reflects a deeper superiority—whether religious, racial, genetic, cultural, or institutional—rather than an accident of timing or geography. Thus the inequality of power and economics of the nineteenth century in favor of Europe was accompanied by the spread of new forms of racism and "culturism," which offered pseudoscientific justifications for the vast inequalities that had opened. These theories in turn justified brutal forms of exploitation of the poor through colonial rule, dispossession of the properties and lands of the poor by the rich, and even slavery.

Still, despite these difficulties, the basic underlying forces that propelled the Industrial Revolution could be and were replicated elsewhere. As they were replicated, multiple sites of industrialization and economic growth took hold. Like a chain reaction, the more places that were undergoing this change, the more they interacted with each other and thereby created the bases for yet more innovations, more economic growth, and more technological activity. Britain's industrialization spread to other markets in several ways: by stimulating the demand for exports from Britain's trading partners, by supplying those trading partners with British capital to make investments in infrastructure (for example, ports and railroads), and by spreading technologies first pioneered in Britain.

This diffusion of modern economic growth occurred in three main forms. The first, and in some ways, most direct spread of the Industrial Revolution was from Britain to its colonies in North America, Australia, and New Zealand. All three regions are in temperate zones with conditions for farming and other economic activities similar in many ways to those of Britain. It was therefore relatively straightforward to transplant British technologies, food crops, and even legal institutions into these new settings. These new homes of modern economic growth were literally a "New England," in the case of the North American seacoast, or a "Western offshoots" in the phrase of Angus Maddison. Ideologically, the imperial powers and colonizers considered North America and Oceania to be empty places, despite the presence of native inhabitants in both regions. By slaughtering, cornering, or removing these native inhabitants...
from their lands, England’s new colonizers fueled a huge expansion of population and subsequent economic growth of North America and Oceania.

A second form of diffusion took place within Europe itself, broadly in a process that ran from Western Europe to Eastern Europe and from Northern Europe to Southern Europe during the nineteenth century. Northwestern Europe started with certain advantages over Eastern and Southern Europe. First, northwestern Europe is on the Atlantic side of the continent, and therefore had benefited more than Eastern Europe from the great explosion of ocean-based trade with the Americas and Asia. Second, northwestern Europe generally had more favorable natural resources, including coal, timber, rivers (for water-powered mills), and rainfall. Third, northwestern Europe generally benefited from a more benign disease environment, less vulnerable to tropical and subtropical diseases like malaria. Fourth, for a host of reasons, some understood and others much debated, the political and social conditions were more favorable. Serfdom had essentially disappeared in much of northwestern Europe by the seventeenth century, whereas serfdom and other social rigidities were far more intact in the south and east. Germany and Italy were still not nation states by the start of the Industrial Revolution, and they suffered from extremely high barriers to trade among competing principalities.

When the Industrial Revolution began, and especially when it began to spread in the midst of and after the Napoleonic Wars, the obstacles to development in Southern and Eastern Europe began to diminish. Serfdom was abolished, fitfully, often violently, across Europe. Constitutional governance was introduced. Railways were established to link European regions. Ideas and technologies flowed with ever greater speed and were backed by ever larger amounts of financial capital. By the end of the nineteenth century, industrialization was making itself felt throughout all of Europe.

The third diffusion involved the spread of modern economic growth from Europe to Latin America, Africa, and Asia. The process was tumultuous everywhere, involving the confrontation of an increasingly industrialized and rich Europe with nonindustrialized, largely rural, and militarily weak societies in other parts of the world. Some were ancient civilizations with grand traditions, like China or Japan; some were sparsely populated regions like those in much of tropical Africa. But the great drama that ensued almost everywhere was the turmoil of confrontation between these different societies, economies, and cultures. Even when it raised living standards, modern economic growth brought fundamental change to social organization and painful clashes with the more powerful Europeans.

The confrontation between rich and poor was very stark because the gap of wealth also meant the gap of power, and power could be used for exploitation. Europe’s superior power was used repeatedly to compel actions by the weaker societies on behalf of the richer overlords. European imperial powers forced Africans to grow cash crops they chose. Colonial authorities imposed head taxes, compelling Africans to work in mines and on plantations, often hundreds of miles from their families and homes. European investors and governments commandeered natural resources, including mineral wealth and vast woodlands in Africa and Asia. Private European companies maintained private armies in the colonies to ensure compliance with company “law,” knowing as well that their national governments would back them up with military force in extremis.

The Cascade of Technological Change

Living standards began to rise in many parts of the world, even with all this brutality and suffering in places that had succumbed to colonial rule; and even in places where colonial masters, rather than the local populations, grabbed much of the increased economic output. Often the climb out of extreme poverty was very gradual and fitful, set back by war and famine. Occasionally it was rapid, such as Japan’s economic takeoff and industrialization in the last quarter of the nineteenth century.

I believe that the single most important reason why prosperity spread, and why it continues to spread, is the transmission of technologies and the ideas underlying them. Even more important than having specific resources in the ground, such as coal, was the ability to use modern, science-based ideas to organize production. The beauty of ideas is that they can be used over and over again, without ever being depleted. Economists call ideas nonrival in the sense that one person’s use of an idea does not diminish the ability of others to use it as well. This is why we can envision a world in which everybody achieves prosperity. The essence of the first Industrial Revolution was not the coal; it was how to use the coal. Even more generally, it was about how to use a new form of energy. The lessons of coal eventually became the basis for many other
energy systems as well, from hydropower, oil and gas, and nuclear power to new forms of renewable energy such as wind and solar power converted to electricity. These lessons are available to all of humanity, not just for the first individuals who discovered them.

The first wave of the Industrial Revolution was the development of the steam engine and related technologies, including the organization of large-scale factory production, new machinery in the textile and apparel sector, and new techniques to produce steel. A second wave of technological breakthroughs came in the middle of the nineteenth century with the rail, and even more notably the telegraph, which offered the first instantaneous telecommunications around the world, a phenomenal breakthrough in the ability to diffuse information on a large scale.

The second technological wave also included ocean steamers, global-scale trade, and two huge infrastructure projects: the Suez Canal, completed in 1869, which significantly shortened the trade time between Europe and Asia, and the Panama Canal, completed in 1914, which dramatically reduced the trade time between the U.S. eastern seaboard and destinations in the western United States, much of Latin America, and East Asia. Epidemics of yellow fever and malaria that killed thousands of workers delayed the first attempt to build the canal in the 1880s. Once scientists understood that mosquitoes were transmitting those killer diseases, the canal builders made a full-fledged effort to control the mosquito breeding alongside the construction of the canal and thereby completed the project in 1914.

The third wave of technological advance involved electrification of industry and urban society at the end of the nineteenth century, including Edison's invention of the incandescent bulb and other electronic appliances. Edison, Westinghouse, and others championed large power plants that could bring electricity into homes, office buildings, and factories by wire, which was the defining new infrastructure of the early twentieth century. The development of the internal combustion engine was also critical, as was the pivotal advance in the chemical industry, mainly in Germany, with the new process for taking atmospheric nitrogen and converting it into ammonia for fertilizer (the Haber-Bosch process). This use of fossil fuel energy to create nitrogen-based fertilizers was the breakthrough advance in raising food production in the twentieth century, enabling a great proportion of humanity, though still not all of it, to overcome chronic hunger and the risks of famine that had forever plagued humankind.

These waves of technological advance diffused around the world through the spread of trade and foreign investment; with it, economic prosperity spread to other parts of the world as well. But so, too, did the global system of European political domination. This domination reflected the vast inequality of power that grew out of Europe's head start in industrialization, a head start that we have seen is rooted in an advantageous confluence of politics, geography, and resource base.

By the early twentieth century, Europe largely dominated the world. European empires controlled essentially all of Africa and large parts of Asia, and loomed large in financing and organizing Latin America's trade as well. This was the first age of globalization, an era of global trade, an era of global communications over telegraph lines, an era of mass production and industrialization—in short, what would seem to be an era of inevitable progress. And it was globalization under European domination. It was viewed as not only economically unstoppable, but also as the natural order of things. This imagined natural order gave rise to the infamous "white man's burden," the right and obligation of European and European-descended whites to rule the lives of others around the world, which they blithely did with a contradictory mix of naïveté, compassion, and brutality.

The Great Rupture

At the beginning of the twentieth century, globalization was viewed as so inevitable that some thought war itself was probably passé, and certainly too irrational that no right-thinking leader in Europe would ever take his country to war. In 1910, a leading British pundit, Norman Angell, wrote The Great Illusion, which rightly argued that national economies had become so interdependent, so much part of a global division of labor, that war among the economic leaders had become unimaginably destructive. War, Angell warned, would so undermine the network of international trade that no military venture by a European power against another could conceivably lead to economic benefits for the aggressor. He surmised that war itself would cease once the costs and benefits of war were more clearly understood.

Angell tremendously underestimated the irrationalities and social processes that lead to devastating outcomes, even when they make no sense. Angell was therefore half right: war had become much too dangerous to use for economic gain. But it didn’t stop war from happening,
The year 1914 began the great rupture of the twentieth century, even more dramatic a rupture than World War II would prove to be.

Why was World War I so dramatic and so traumatic? It ended the era of European-led globalization. Its death toll was staggering, and it led to several cataclysmic events that cast their shadow over the rest of the century. The first side effect was that it destabilized the Russian czarist regime, unleashing the Bolshevik revolution. A relatively backward Russia, which had been the last country in Europe to come out of serfdom, fell into turmoil under the fiscal and human burdens of war. Vladimir Lenin and a small group of conspirators were able to seize power with very little popular support and institute a revolutionary doctrine that sent Russia on a seventy-five-year detour of enormous brutality and economic waste. At their maximum extent, the communist doctrines that Lenin and Joseph Stalin instituted in Russia ensnared roughly a third of the world’s population, including the former Soviet Union, China, the Eastern European states under Soviet domination, Cuba, North Korea, and other self-styled revolutionary states aligned with the Soviet Union.

Another great consequence of World War I was the prolonged financial instability it created in Europe after the war. The war created a morass of interlocking financial and economic problems, including the mountain of debt incurred by combatant countries; the destruction and dismembering of the Ottoman and Hapsburg empires and their replacement by small, unstable, and feuding successor states; and the Allied claims for reparation payments from Germany, which embittered the next generation of Germans and was one of the rallying points for Hitler’s rise to power.

John Maynard Keynes understood that the world as he knew it had been brought to an end after World War I. In his famous essay on *The Economic Consequences of the Peace*, Keynes masterfully captured all that had been lost:

What an extraordinary episode in the economic progress of man that age was which came to an end in August 1914! The greater part of the population, it is true, worked hard and lived at a low standard of comfort, yet were, to all appearances, reasonably contented with this lot. But escape was possible, for any man of capacity or character at all exceeding the average, into the middle and upper classes, for whom life offered, at a low cost and with the least trouble, conveniences, comforts, and amenities beyond the compass of the rich-est and most powerful monarchs of other ages. The inhabitant of London could order by telephone, sipping his morning tea in bed, the various products of the whole earth, in such quantity as he might see fit, and reasonably expect their early delivery upon his doorstep; he could at the same moment and by the same means adventure his wealth in the natural resources and new enterprises of any quarter of the world, and share, without exertion or even trouble, in their prospective fruits and advantages; or he could decide to couple the security of his fortunes with the good faith of the townspeople of any substantial municipality in any continent that fancy or information might recommend. He could secure forthwith, if he wished it, cheap and comfortable means of transit to any country or climate without passport or other formality, could despatch his servant to the neighbouring office of a bank for such supply of the precious metals as might seem convenient, and could then proceed abroad to foreign quarters, without knowledge of their religion, language, or customs, bearing coined wealth upon his person, and would consider himself greatly aggrieved and much surprised at the least interference. But, most important of all, he regarded this state of affairs as normal, certain, and permanent, except in the direction of further improvement, and any deviation from it as aberrant, scandalous, and avoidable.

As Keynes stressed, in a message for our time, the end of this era was simply unimaginable:

The projects and politics of militarism and imperialism, of racial and cultural rivalries, of monopolies, restrictions, and exclusion, which were to play the serpent to this paradise, were little more than the amusements of his daily newspaper, and appeared to exercise almost no influence at all on the ordinary course of social and economic life, the internationalisation of which was nearly complete in practice.

The economic instability that followed World War I led to the Great Depression of the 1930s and then to World War II. The linkages are subtle and debated in detail, but undeniable in basic fact. The overhang of bad debts, shrunken trade within Europe, and overstretched budgets of the European powers meant that inflation, stabilization, and austerity were
the orders of the day throughout the 1920s. The European countries duly climbed one by one back to the gold standard, viewed at the time as the guarantor of long-term financial stability. Alas, the return to the gold standard did little more than exacerbate the conditions that had prevailed in the 1920s. Most important, the gold standard and its "rules of the game" for monetary management made it difficult if not impossible for the major economies to escape from a slide into deep depression in the early 1930s. The Great Depression, in turn, triggered a calamitous spread of trade protectionism and the rise of Nazism in Germany and military rule in Japan.

By the end of World War II, the pre-1914 global system had gone to pieces. International trade was moribund. National currencies were not convertible one to another, so even the basic payments mechanisms for international commerce had broken down. Mercifully, the age of European imperialism was also coming to an end, although it would take decades longer, and many wars, for it to end decisively. Still, standing on the ruins of World War II, the benefits of a global marketplace—with a global division of labor, a peaceful spread of technology, and open international trade—looked long gone, buried under the rubble of two world wars and a great depression.

RECONSTRUCTING A GLOBAL ECONOMY

Much work between the end of World War II in 1945 and the end of the Soviet Union in 1991 went into reconstructing a new global economic system. The immediate struggle was physical reconstruction: to repair or rebuild the roads, bridges, power stations, and ports that underpinned national economic production and international trade. Yet the "plumbing" of the international economy also needed to be reconstructed, with currency arrangements and rules for international trade that would permit the market-based flow of goods and services, and the productivity gains that would emerge from a renewed global division of labor. This reconstruction effort took place in three steps.

First, the countries already industrialized as of 1945—Europe, the United States, Japan—reconstructed a new international trading system under U.S. political leadership. Step by step, these countries reestablished currency convertibility (in which businesses and individuals could buy and sell foreign exchange at market rate) in order to create a payments system for international trade. The European currencies became convertible again in 1958. The yen became convertible again in 1964. At the same time, these countries agreed to reduce the trade barriers, including high tariffs and quotas, which they had put in place in the chaos of the Great Depression. The trade barriers came down in several rounds of international trade negotiations handled under the auspices of the General Agreement on Tariffs and Trade (GATT), a set of rules that constituted the forerunner to today's World Trade Organization. The rich world, soon called the first world, succeeded in reconstructing a market-based trading system. With it came a burst of rapid economic growth, a powerful recovery after decades of war, blocked trade, and financial instability.

The restoration of trade in the first world did not, however, mean the restoration of a global economy. The divisions in the world economy after 1945 went deeper than currency inconvertibility and trade barriers. By the end of the World War II, the world had become starkly divided in political terms that mirrored the economic ruptures. These divisions would last for decades and are only now being healed.

The second world was the socialist world, the world first forged by Lenin and Stalin in the wake of World War I. The second world remained cut off economically from the first world until the fall of the Berlin Wall in 1989 and the end of the Soviet Union in 1991. At its peak, the second world included around thirty countries (depending on the criteria for inclusion), and included about a third of humanity. The overriding characteristics of the second world were state ownership of the means of production, central planning of production, one-party rule by communist parties, and economic integration within the socialist world (through barter trade) combined with economic separation from the first world.

The third world included the rapidly rising number of postcolonial countries. Today we use the term third world simply to mean poor. Earlier on, the third world had a more vivid connotation as a group of countries emerging from imperial domination that chose neither to be part of the capitalist first world nor the socialist second world. These were the true third-way countries. The ideas at the core of the third world were: "We will develop on our own. We will nurture industry, sometimes through state ownership, sometimes by giving subsidies and protection to private business, but we will do it without foreign multinationals. We will do it without open international trade. We do not
trust the outside world. We want to stay nonaligned. The first world countries are not our heroes; they were our former colonial powers. The second world leaders are not to be trusted either. We do not want the Soviet Union to swallow us. Therefore, politically we are nonaligned, and economically we are self-sufficient.

Thus, the post–World War II world evolved on three tracks. The fundamental problem, however, was that the second world and third world approaches did not make economic sense, and they both collapsed under a pile of foreign debt. Second world central planning was a bad idea, and so, too, was third world autarky, in both cases for reasons that Adam Smith had explained. By closing their economies, both the second world and third world countries also closed themselves off from global economic progress and the advance of technology. They created high-cost local industries that could not compete internationally even when they chose to try. The closed nature of these societies, in which domestic businesses were sheltered from competition, fostered a great deal of corruption. The nonaligned third world countries lost the chance to participate in the technological advance of the first world mainly because they did not trust the first world. They were understandably intent on protecting their hard-won sovereignty, even when that sovereignty was not really at risk.

My own work as an economist began at a time when the second world and the third world economies were already economically moribund, and were falling into a deepening spiral of economic chaos. The early manifestations of that crisis, typically, were rising levels of foreign debt and increasing rates of inflation. My early work centered on macroeconomic stabilization—the end of high inflation—and this work brought me into contact with countries that were isolated from first world markets and technology. This early work involved technical monetary economics, but it brought me face to face with the more basic and fundamental choices of how countries should relate economically to the broader world.

By the early 1990s, the overwhelming majority of countries of the second world and third world were saying, “We need to be part of the global economy once again. We want our sovereignty; we want our self-determination, but we will abandon Leninist-Stalinist central planning because it doesn’t work. And we will abandon the idea of self-imposed autarky, because economic isolation makes no more sense for a country than it does for an individual.” In essence, one of my roles from the mid-1980s onward was to help countries to become sovereign members of a new international system. I repeatedly dealt with three big questions: What is the best way back to international trade? How do we escape from the barnacles of bad debts and inefficient industry? How do we negotiate new rules of the game to ensure that the emerging global economy would truly serve the needs of all of the countries of the world, not only the richest and most powerful?

**TWO HUNDRED YEARS OF MODERN ECONOMIC GROWTH**

I have touched lightly and briefly on two hundred years of modern economic growth—complete with change, turmoil, conflict, and ideology. What has this era of modern economic growth brought the world? Higher living standards than were imaginable two centuries ago, a spread of modern technology to most parts of the world, and a scientific and technological revolution that still gains strength. Living standards are much higher in almost all places than they were at the start of the process, the major exception being the disease-ravaged parts of Africa.

But modern economic growth has also brought phenomenal gaps between the richest and poorest, gaps that were simply impossible when poverty gripped all of the world. The era of modern economic growth has bequeathed us an economic picture of the world as seen in map 2, where each country is shaded according to its per capita GDP (measured in purchasing-power adjusted prices) as of 2002. The rich world (above $20,000 in per capita income) is shaded green, and includes the United States, Canada, Western Europe, Japan, Australia, and New Zealand. The countries in the middle-income range (between $4,000 and $20,000) are shaded in yellow, and include most of East Asia (such as Korea and Singapore), Central Europe, the former Soviet Union, and Latin America. Countries within the upper end of the low-income range (between $2,000 and $4,000) are shaded in orange, and include parts of South America, South Asia, and East Asia. The poorest countries (below $2,000) are shaded in red, and are concentrated in sub-Saharan Africa and South Asia. There is, of course, a striking similarity between this map of average GNP per person and the map showing the
of the world’s population of 6.3 billion, roughly 5 billion people have reached at least the first rung of economic development. Five sixths of the world’s population is at least one step above extreme poverty. Moreover, approximately 4.9 billion people live in countries where average income—measured by GDP per person—increased between 1980 and 2000. An even larger number, roughly 5.7 billion people, live in countries where life expectancy increased. Economic development is real and widespread. The extent of extreme poverty is shrinking, both in absolute numbers and as a proportion of the world’s population. That fact is why we can realistically envision a world without extreme poverty as soon as 2025.

Precisely because economic development can and does work in so many parts of the world, it is all the more important to understand and solve the problems of the places where economic development is not working, where people are still off the ladder of development, or are stuck on its lowest rungs. To understand why economic growth succeeds or fails, we first need a conceptual framework that can account for changes over time in GDP per person. I have already discussed some of the factors that promote long-term development, but here I address them more systematically, including a discussion of why the process of economic development breaks down in many places, especially the poorest places. Perhaps it would be clearest to begin with a very specific case: a single farm household.
THE GROWTH OF HOUSEHOLD INCOME

Consider a household consisting of a husband, wife, and four children (two daughters and two sons) living on a two-hectare farm. The household grows maize and provides for its own shelter in an adobe hut. Being extremely poor, the family consumes its own maize harvest and earns no other cash income during most years. The children collect fuelwood in the vicinity of the farm for cooking, and fetch drinking water from a nearby spring.

This year the household produces two tons of maize per hectare, or four tons in total. Even though the household eats its own maize, the statisticians in the government will assign this household an income based on the market value of the maize. Suppose that each ton of maize sells in the local market for $150 per ton. The household's imputed annual income will be $600 ($150 per ton times four tons), or $100 per capita ($600 divided by six people). The government will add this figure to other household incomes to calculate the country's gross national product.

The family's income per capita can increase in at least four ways the following year.

Saving

The household might decide to consume only three out of the four tons of maize, and take one ton to market. With the $150, the household invests in livestock (perhaps chickens or sheep or a bull or dairy cow). The livestock generate a new stream of income, whether from improved food yields by using the bull for manure and animal traction, or the cow for sales of milk, or the animals for meat, eggs, or hides. In economic jargon, the saving has led to capital accumulation (in the form of livestock), which in turn has raised household productivity.

Trade

In a different scenario, the household learns from a neighboring farmer that it has the right kind of farmland, climate, and soil to produce vanilla beans, with a much higher income. After some deliberation, the household decides to shift to vanilla as a cash crop. The next year the household earns $800 in vanilla, and uses $600 to buy four tons of grain for food. As more vanilla farmers arise in the region, a new group of trading firms also forms, specializing in shipping and storage of vanilla, food, and farm inputs.

This pattern exemplifies Adam Smith's insight into the two-way link from specialization to expanded markets back to increased specialization. The farm household specializes in high-value vanilla farming because it lives in favorable ecological conditions for vanilla trees. It relies on the market to trade with other households, which instead specialize in producing food. As incomes rise, and the "extent of the market" increases, to use Smith's phrase, there is room for further specialization, in this case in transport services. Later on, economic activities will be further divided among firms specializing in housing construction, clothing manufacturing, road maintenance, plumbing, electricity, water and sanitation systems, and so forth.

Technology

Alternatively, an agricultural extension officer teaches the farm household how to manage the soil nutrients in a new and improved manner by planting special nitrogen-fixing trees that replenish the vital nitrogen nutrients of the soil, and to multiply the benefits by using improved grains. The new cereal varieties are faster maturing and pest resistant, and they flourish with the replenished soil nutrients. As a result, the crop yield rises in a single year to three tons of maize per hectare, or six tons in total. The income per capita therefore rises to $150 (three tons per hectare times two hectares at $150 per ton divided by six people).

Resource Boom

The farm household is able to move to a much larger and more fertile farm after the government's success in controlling the breeding of black flies, which spread African river blindness. Suddenly there are thousands of hectares of new farmland and a significant expansion of production capacity as a result. Incomes rise and hunger falls as each household in the newly opened region is able to triple its previous food output.

These four pathways to higher income are the main ways that economies grow, albeit in much more complicated settings than I have just described. In actual economies, a rise in gross domestic product (GDP)
per capita is typically the result of most or all of these four processes simultaneously at work: saving and capital accumulation, increasing specialization and trade, technological advance (and a resulting rise in output for a given amount of inputs), and greater natural resources per person (and a resulting increase in the level of output per person). Although I have illustrated these pathways to rising income at the level of an individual household, in fact each of these processes operates through the interactions of thousands or millions of households linked together by markets and collective actions through public policies and public investments.

What, instead, could lead to a reduction of household income per capita? In general, an economy can rewind the clock, moving backward rather than forward. Here are a number of ways that this might happen.

**Lack of Saving**

Suppose that the household is chronically hungry and, therefore, consumes all of the four tons of maize, leaving nothing to sell to the market and no income to use to purchase a new plow. In fact, during the year, the existing plow breaks down. Next year's crop falls below four tons, and household income per person declines. The broken plow counts as capital depreciation, or a fall in the amount of capital available per worker.

**Absence of Trade**

In another case, suppose the household hears about the vanilla opportunity, but is unable to make use of it. There may be no road linking the farm and the regional market, so it is not possible for the household to market the vanilla or to use the proceeds to buy food. As a result, the household passes up the opportunity to specialize in a cash crop and stays with the food crop on which it depends to stay alive. Trade can similarly be hampered, or blocked altogether, by violence (which impedes the reliable shipment of goods), monetary chaos (so that money is not a reliable medium of exchange), price controls, and other forms of government intervention that may impede specialization and trade.

**Technological Reversal**

What if, as often happens in rural Africa, the children lose their mother and father to HIV/AIDS? The oldest child takes charge, but has not yet had time to master proper farming techniques. The next crop fails, and the children must depend on other households in the village. The household income has declined to zero because the level of technological knowledge has actually declined. Technological know-how is not automatically inherited. Each new generation must learn technological expertise.

**Natural Resource Decline**

To illustrate another possibility, not only is there no additional land, but part of the existing farmland gives way to environmental decline. Specifically, the household has not been able to afford fertilizer and does not know about nitrogen-fixing trees, so the nitrogen in the farmland is seriously depleted. The result is that only one hectare remains in production, and household annual income falls to a devastating $50 per capita (two tons times $150 per ton divided by six).

**Adverse Productivity Shock**

A natural disaster, perhaps a flood, drought, heat wave, frost, pests, or disease in the household (for example, a bout of malaria), or some combination, wipes out household income for the year.

**Population Growth**

A generation passes. The parents die, and the two hectares are divided between the two sons. Each son now has a wife and four children. Assuming that crop yields of two tons per hectare remain unchanged, household income per capita has declined by half because the size of the population living on the same farm has doubled. This experience has been prevalent in rural Africa’s in the most recent generations.

These simple illustrations show the many ways that even a simple one-household "economy" may grow, as well as the many ways that the household economy can decline. The first task of a development specialist looking at the conditions in any particular country is to under-
WHY COUNTRIES FAIL TO ACHIEVE ECONOMIC GROWTH

The most common explanation for why countries fail to achieve economic growth often focuses on the faults of the poor: poverty is a result of corrupt leadership and retrograde cultures that impede modern development. However, something as complex as a society’s economic system has too many moving parts to presume that only one thing can go wrong. Problems can occur in different parts of the economic machine and can sometimes cascade, bringing the machine to a near halt.

In economic growth, eight major categories of problems can cause an economy to stagnate or decline. I have witnessed these kinds of disasters in many parts of the world. Each has its own different appropriate course of treatment; therefore, a good diagnosis is crucial.

The Poverty Trap: Poverty Itself as a Cause of Economic Stagnation

The key problem for the poorest countries is that poverty itself can be a trap. When poverty is very extreme, the poor do not have the ability—by themselves—to get out of the mess. Here is why: Consider the kind of poverty caused by a lack of capital per person. Poor rural villages lack trucks, paved roads, power generators, irrigation channels. Human capital is very low, with hungry, disease-ridden, and illiterate villagers struggling for survival. Natural capital is depleted: the trees have been cut down and the soil nutrients exhausted. In these conditions the need is for more capital—physical, human, natural—but that requires more saving. When people are poor, but not utterly destitute, they may be able to save. When they are utterly destitute, they need their entire income, or more, just to survive. There is no margin of income above survival that can be invested for the future.

This is the main reason why the poorest of the poor are most prone to becoming trapped with low or negative economic growth rates. They are too poor to save for the future and thereby accumulate the capital per person that could pull them out of their current misery. Table 1 shows the rate of gross domestic saving as a share of GDP for countries at different income levels. Clearly, the poorest of the poor have the lowest saving rate because they are using their income merely to stay alive.

<table>
<thead>
<tr>
<th>Income Level</th>
<th>Saving Rate as % of GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper-Middle-Income Countries</td>
<td>25%</td>
</tr>
<tr>
<td>Lower-Middle-Income Countries</td>
<td>28%</td>
</tr>
<tr>
<td>Low-Income Countries</td>
<td>19%</td>
</tr>
<tr>
<td>Least-Developed Countries</td>
<td>10%</td>
</tr>
</tbody>
</table>

In fact, the standard measures of domestic saving, based on the official national accounts, overstate the saving of the poor because these data do not account for the fact that the poor are depleting their natural capital by cutting down trees, exhausting soils of their nutrients, mining their mineral, energy, and metal deposits, and overfishing. These forms of natural capital are not monitored in the official national accounts data and, as a result, their “depreciation” or depletion is not recognized as a form of negative saving. When a tree is cut down and sold for fuelwood, and not replanted, the earnings to the logger are counted as income, but instead should be counted as a conversion of one capital asset (the tree) into a financial asset (money).

Physical Geography

Even if the poverty trap is the right diagnosis, it still poses the question of why some impoverished countries are trapped and others are not. The answer often lies in the frequently overlooked problems of physical geography. Americans, for example, believe that they earned their wealth all by themselves. They forget that they inherited a vast continent rich in natural resources, with great soils and ample rainfall, immense navigable rivers, and thousands of miles of coastline with dozens of natural ports that provide a wonderful foundation for sea-based trade.

Other countries are not quite so favored. Many of the world’s poorest countries are severely hindered by high transport costs because they are landlocked; situated in high mountain ranges; or lack navigable rivers, long coastlines, or good natural harbors. Culture does not ex-
plain the persistence of poverty in Bolivia, Ethiopia, Kyrgyzstan, or Tibet. Look instead to the mountain geography of a landlocked region facing crushing transport costs and economic isolation that stifle almost all forms of modern economic activity. Adam Smith was acutely aware of the role of high transport costs in hindering economic development. He stressed, in particular, the advantages of proximity to low-cost, sea-based trade as critical, noting that remote economies would be the last regions to achieve economic development:

As by means of water-carriage a more extensive market is opened to every sort of industry than what land-carriage alone can afford it, so it is upon the sea-coast, and along the banks of navigable rivers, that industry of every kind naturally begins to subdivide and improve itself, and it is frequently not till a long time after that those improvements extend themselves to the inland part of the country.

Other kinds of geographical distress are also at play. Many countries are trapped in arid conditions with low agricultural productivity or vulnerability to prolonged droughts. Most of the tropics have ecological conditions that favor killer diseases like malaria, schistosomiasis, dengue fever, and dozens of others. Sub-Saharan Africa, in particular, has an ideal rainfall, temperature, and mosquito type that make it the global epicenter of malaria, perhaps the greatest factor in slowing Africa's economic development throughout history. Jared Diamond, in his wonderful book *Guns, Germs, and Steel*, gives a magnificent account of how geography helped shape the early stages of human civilization. He offers scintillating insights into how the Americas, Africa, Europe, and Asia differed in terms of indigenous crop species, animals for domestication, ease of transport, possibilities for the spread of technology, disease ecology, and other geographically related factors in economic development. Some of these factors, of course, became much less or not at all important with the advent of modern transportation and communications and the resulting transfer of crops and animal species across different regions of the world.

Fortunately, none of these conditions is fatal to economic development. It is time to banish the bogeyman of geographical determinism, the false accusation that claims about geographical disadvantage are also claims that geography single-handedly and irrevocably determines the economic outcome of nations. The point is only that these adversities require countries to undertake additional investments that other, more fortunate, countries did not have to make. Roads can be built from a landlocked country to a port in another country. Tropical diseases can be controlled. Arid climates can be overcome with irrigation. Adverse geography poses problems that can be solved, typically through physical investments and good conservation management. But adverse geography raises the costs of solving the problems of farming, transport, and health, and thereby makes it much more likely that a country will be caught in a poverty trap.

**Fiscal Trap**

Even when the private economy is not impoverished, the government may lack the resources to pay for the infrastructure on which economic growth depends. Governments are critical to investing in public goods and services like primary health care, roads, power grids, ports, and the like. The government may lack the financial means to provide these public goods, however, for at least three reasons. First, the population itself may be impoverished, so taxation of the population is not feasible. Second, the government may be inept, corrupt, or incapacitated, and thereby unable to collect tax revenues. Third, the government may already be carrying a tremendous load of debt (for example, debt carried forward from an earlier decade), and must use its limited tax revenue to service the debt rather than to finance new investments. This third case is often called a debt overhang. Debt from the past crushes the prospects for growth in the future. In such circumstances, debt cancellation may be the only way to give the country a fresh start on a path of economic development.

**Governance Failures**

Economic development requires a government oriented toward development. The government has many roles to play. It must identify and finance the high-priority infrastructure projects, and make the needed infrastructure and social services available to the whole population, not just a select few. The government must create an environment conducive to investments by private businesses. Those investors must believe that they will be allowed to operate their business and to keep their future profits. Government must exercise self-restraint in demanding
bribes or side payments. Governments must also maintain internal peace and safety so the safety of persons and property is not unduly threatened, maintain judicial systems that can define property rights and honestly enforce contracts, and defend the national territory to keep it safe from invasion.

When governments fail in any of these tasks—leaving huge gaps in infrastructure, or raising corruption to levels that impair economic activity, or failing to ensure domestic peace—the economy is sure to fail, and often to fail badly. Indeed, in extreme cases, when governments are unable to perform their most basic functions, we talk about “state failures,” which are characterized by wars, revolutions, coups, anarchy, and the like. We will see later on that state failures are often not only the cause of economic disaster, but also the last stage of it. State failure and economic failure can chase each other in a dizzying and terrifying spiral of instability.

**Cultural Barriers**

Even when governments are trying to advance their countries, the cultural environment may be an obstacle to development. Cultural or religious norms in the society may block the role of women, for example, leaving half of the population without economic or political rights and without education, thereby undermining half of the population in its contribution to overall development. Denying women their rights and education results in cascading problems. Most important, perhaps, the demographic transition from high fertility to low fertility is delayed or blocked altogether. Poor households continue to have six or seven children because the woman’s role is seen mainly as child rearing, and her lack of education means that she has few options in the labor force. In these settings women often lack basic economic security and legal rights; when they are widowed, their social circumstances turn even more dreadful, and they are left completely impoverished without hope for improvement.

Similar cultural barriers may apply to religious or ethnic minorities. Social norms may prevent certain groups from gaining access to public services (such as schooling, health facilities, or job training). These minorities may be blocked from entering universities or public sector jobs. They may face harassment in the community, including boycotts of their businesses and physical destruction of property. In extreme circumstances, as occurred in East Africa with the Indian community, wholesale “ethnic cleansing” may ensue, with many fleeing for their lives.

**Geopolitics**

It takes two to trade. Trade barriers erected by foreign countries can impede a poor country’s economic development. These barriers are sometimes political, as when a powerful country imposes trade sanctions on a regime that it does not like. These sanctions may aim to weaken or topple a despicable regime, but often they simply impoverish the population of the targeted country without toppling the regime. Many factors in addition to trade that may affect a country’s development can be manipulated from abroad for geopolitical reasons.

**Lack of Innovation**

Consider the plight of inventors in an impoverished country. Even if these inventors are able to develop new scientific approaches to meet local economic needs, the chances of recouping investments in research and development through later sales in the local market are very low. The local purchasing power to buy a new product is tiny, and will not provide for sufficient profits if an invention is successfully brought to market, even if the impoverished country has state-of-the-art patent legislation. The problem is not the property rights to the invention, but the size of the market.

There is, therefore, a huge difference between rich and poor countries in their tendency to innovate. Rich countries have a big market, which increases the incentive for innovation, brings new technologies to market, further raises productivity and expands the size of the market, and creates new incentives for innovation. This momentum creates, in effect, a chain reaction, which economists call endogenous growth. Innovation raises the size of the market; a larger market raises the incentives for innovation. Therefore, economic growth and innovation proceed in a mutually reinforcing process.

In the rich countries of North America, Western Europe, and East Asia, the process of massive investment in research and development, leading to sales of patent-protected products to a large market, stands at the core of economic growth. Advanced countries are typically investing 2 percent or more of their gross national product directly into the research and development process, and sometimes more than 3 percent
of GDP. That investment is very sizable, with hundreds of billions of dollars invested each year in research and development activities. Moreover, these investments are not simply left to the market. Governments invest heavily, especially in the early stages of R and D (more in R, research, than in D, development, although government finance is present at both stages).

In most poor countries, especially smaller ones, the innovation process usually never gets started. Inventors do not invent because they know that they will not be able to recoup those large, fixed costs of developing a new product. Impoverished governments cannot afford to back the basic sciences in government labs and in universities. And the scientists do not stay. The result is an inequality of innovative activity that magnifies the inequality of global incomes. Although today’s low-income countries have 37 percent of the world’s population and 11 percent of the world’s GDP (adjusted for differences in purchasing power), these countries accounted for less than 1 percent of all of the U.S.-registered patents taken out by inventors in the year 2000. The top twenty countries in patenting, all high-income countries, account for 98 percent of all patents.

Over the span of two centuries, the innovation gap is certainly one of the most fundamental reasons why the richest and the poorest countries have diverged, and why the poorest of the poor have not been able to get a foothold on growth. The rich move from innovation to greater wealth to further innovation; the poor do not. Fortunately, there are a few opportunities for innovation, although these are not as robust as we would hope.

The first is the diffusion of technology. Even when countries are not inventors of technology, they can still be beneficiaries through the importation of technology. All countries today, without exception, are using personal computers, and cell phones are reaching most parts of the world as well, even very poor places. Innovations can be imported through consumer goods, capital imports by business (in the form of machinery, for example), foreign direct investment (in which a high-tech firm sets up a factory in a poor country), or textbooks, word of mouth, and reverse engineering. History is replete with examples in which new capital goods and blueprints were simply pilfered and brought to a new location.

However, the importation of technology can be frustrated in the poorest of the poor countries. These countries may be too poor to purchase the capital goods, and they may be unattractive as places for foreign investment, given their lack of infrastructure. But there is often a much deeper problem. Many of the key breakthroughs in technology developed in the rich countries are relevant for the particular ecological conditions of the rich countries, and are not especially useful in the tropical, or arid, or mountain environments where so many of the extreme poor live today. The massive investments in biomedical research in the rich countries, more than $70 billion, largely overlook the challenges of tropical diseases such as malaria. Rich-country funding is, not surprisingly, aimed at rich-country diseases.

Many poor East Asian countries were initially successful in raising technology not so much through home-grown innovation as through their success in attracting foreign investors who brought the technologies with them. As early as the late 1960s, Texas Instruments, National Semiconductor, and Hewlett Packard, among others, set up operations in Singapore, Penang Island (Malaysia), and other parts of East Asia. They saved a lot of money but also introduced what were otherwise very poor economies to sophisticated scientific technology and advanced management processes. If a poor country can become an attractive place for high-technology enterprises to conduct part of their production activities, then they can become a home, even at a low level of development, to quite sophisticated production and management techniques. Under the right circumstances, hosting such activities on the home turf can then lead to a diffusion of knowledge, and participation in modern production, so that those benefits can then be transferred to domestic firms.

The process even works in technologically humbler sectors like apparel. When foreign investors such as Wal-Mart, J. C. Penney, Yves Saint Laurent, and others outsource their production to Dhaka, they bring in the latest fashion designs and integrate the local production unit into a global supply chain. The local production units do the cutting, stitching, labeling, and packaging of the merchandise, which is designed and ultimately destined for the United States and Europe. These factories become important training grounds for climbing the technology ladder, moving from basic technology up to the next steps. A cutting and stitching company may take 100 percent of the fashion design orders from abroad at the beginning, but later on, once it gets the hang of it, it may start hiring its own designers, and start selling not only the labor of the assembly operation, but also the designs. That progression has happened over and over again throughout the world.
What prevents this process from taking hold everywhere in the world? Eventually it can, but in the early stages the process almost always starts right at a port. The accompanying maps, 3 and 4, show the locations of multinational companies in the electronics sector and in textiles and garment manufacturing, illustrating the coastal location of these firms, especially in their operation in the poor countries. Hinterlands have lagged far behind in their ability to attract these kinds of industries.

It is no coincidence that booming sites for foreign investment—such as Penang Island (Malaysia), Singapore, Taiwan, Hong Kong, and Mauritius—are all islands on the Asia-Europe trade route. It is no coincidence that China’s leading economic city, Shanghai, sits right on the coast at the mouth of the Yangtze River. It is no coincidence that Mexico’s assembly sector is right along the Rio Grande River, since Mexico’s economically relevant “coast” is its border with the United States. The same geographical advantages are seen in many other places that have received substantial foreign investments in recent years. Wroclaw, Poland, and Bratislava, Slovakia, and Lada Bolislav, Czech Republic, and Lubljiana, Slovenia, have all reaped an extra bonus of jobs and technology transfer by virtue of their proximity to Western European markets.

The Demographic Trap

Most countries have experienced a significant decline in fertility rates in recent decades. Half the world, including all of the rich world, is at or near the so-called replacement rate of fertility, in which each mother is raising one daughter on average to “replace” her in the next generation. The replacement rate is two children, one of whom, on average, is a girl. (In fact, the replacement rate is a little bit above two, to take into account the possibility that the daughter will not survive to reproductive age.) The poorest of the poor countries, by contrast, are stuck with fertility rates of five or more. On average, a mother is raising at least two girls, and in some cases three girls or more. In those circumstances, national populations double each generation.

However, the demographic transition has occurred in most parts of the world. Moreover, although Western Europe’s demographic transition took a century or more, the transition among developing countries in the twentieth century has occurred over decades or just a few years. In Bangladesh, the total fertility rate fell from 6.6 in 1975 to just 3.1 in 2000, as we saw plainly with the BRAC microfinance group in the village outside of Dhaka. In Iran following the 1979 Islamic revolution, the transformation was even faster, from 6.7 in 1980 to just 2.6 in 2000. The Iranian revolution, it seems, brought a generation of young girls into the schools, and this boom in girls’ literacy has translated rapidly and dramatically into the desire for fewer children.

One reason for a poverty trap is a demographic trap, when impoverished families choose to have lots of children. These choices are understandable, yet the results can be disastrous. When impoverished families have large numbers of children, the families cannot afford to invest in the nutrition, health, and education of each child. They might only afford the education of one child, and may send only one son to school. High fertility rates in one generation, therefore, tend to lead to impoverishment of the children and to high fertility rates in the following generation as well. Rapid population growth also puts enormous stresses on farm sizes and environmental resources, thereby exacerbating the poverty.

As with the other obstacles to economic growth, the demographic trap is avoidable. Girls’ education would allow women to more easily join the labor force, increasing their earning power and the “cost” of staying home to bear children. Education, law, and social action can empower women to more easily make fertility choices (instead of having those
choices made solely by husbands or others in the family). Children can be treated for disease to better ensure their survival, meaning that parents can have fewer children, feeling secure that they will survive to take care of their parents in old age. Family planning and reproductive health services can be provided even in very poor communities. All of this requires money, however, and money is lacking in the poorest economies.

Figure 1 shows how the total fertility rate in the year 2001 compared with the country’s national income per person. The total fertility rate and hence the population growth rate, is stunningly high especially in the poorest parts of the world. Here is the demographic trap in vivid perspective: the poorest places, many with the greatest obstacles to modern economic growth, are also the places where families have the most numbers of children, and where the populations continue to soar. High population growth leads to deeper poverty, and deeper poverty contributes to high fertility rates.

WHERE GROWTH HAS FAILED

Map 5 shows all of the countries in the world where per capita GDP declined during the twenty-year period between 1980 and 2000. Notice that not one single rich country in North America, Western Europe, or East Asia failed to achieve economic growth! All of the problems lie in the developing world. Forty-five countries had negative growth in GDP per capita. (Only countries with a population of at least two million people in 1980 were examined in order to avoid the idiosyncrasies of some very small countries.)

It is illuminating to divide the world’s economies into the following six categories, depending on their per capita income in 1980:

- All low-income countries
- Middle-income oil exporters
- Middle-income postcommunist countries
- Other middle-income countries
- High-income oil exporters
- All other high-income countries

<table>
<thead>
<tr>
<th>Table 2: Country Classifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative Economic Growth</td>
</tr>
<tr>
<td>---------------------------------</td>
</tr>
<tr>
<td>Angola</td>
</tr>
<tr>
<td>Benin</td>
</tr>
<tr>
<td>Botswana</td>
</tr>
<tr>
<td>Cameroon</td>
</tr>
<tr>
<td>Central African Rep.</td>
</tr>
<tr>
<td>Côte d'Ivoire</td>
</tr>
<tr>
<td>Ecuador</td>
</tr>
<tr>
<td>Ethiopia</td>
</tr>
<tr>
<td>Guatemala</td>
</tr>
<tr>
<td>Haiti</td>
</tr>
<tr>
<td>Honduras</td>
</tr>
<tr>
<td>Jordan</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Post-Soviet Countries</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Country Classifications</td>
</tr>
<tr>
<td>MIDDLE-LOW-Income</td>
</tr>
<tr>
<td>Fuel Exporters</td>
</tr>
<tr>
<td>Algeria</td>
</tr>
<tr>
<td>Other Middle Income</td>
</tr>
<tr>
<td>South Africa</td>
</tr>
<tr>
<td>Non-Fuel Exporters</td>
</tr>
<tr>
<td>Australia</td>
</tr>
<tr>
<td>Austria</td>
</tr>
<tr>
<td>Belgium</td>
</tr>
<tr>
<td>Belgium</td>
</tr>
<tr>
<td>Canada</td>
</tr>
<tr>
<td>Denmark</td>
</tr>
<tr>
<td>Finland</td>
</tr>
<tr>
<td>France</td>
</tr>
<tr>
<td>Germany</td>
</tr>
<tr>
<td>Israel</td>
</tr>
<tr>
<td>Fuel Exporters</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>HIGH-Income Countries</td>
</tr>
<tr>
<td>Fuel Exporters</td>
</tr>
<tr>
<td>Saudi Arabia</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

The accompanying table 2 lists the countries in each category, divided into two columns: those that experienced positive economic growth and those that experienced outright economic decline. The numbers of countries in each category are shown in the two columns at the right of the table. There are several key points. First, the biggest problem with economic decline is indeed in the poorest countries, especially but not only in sub-Saharan Africa. The second observation is that except for oil-exporting and ex-Soviet countries, all high-income countries achieved economic growth, as did most middle-income countries. The only growth failure among high-income countries occurred in Saudi Arabia, an oil-exporting country. Among the middle-income countries, the vast proportion of growth failures were in the oil-exporting and postcommunist countries. In the rest of the middle-income countries, twelve out of fourteen countries enjoyed positive economic growth.

The economic declines in the oil-producing and postcommunist countries reflect very unusual circumstances. The oil-rich states are, of course, not impoverished countries, but instead are middle-income and high-income countries where the economic activity depends overwhelmingly on oil exports. These economies rise and fall in line with the "real" price of oil, that is, the price of oil relative to the price of imported goods such as machinery and consumer goods. The real price of oil soared during the 1970s, leading to the massive growth in living standards of these economies, but during the 1980s and 1990s, the oil price fell sharply, leading to a collapse of living standards. If there is a lesson here, it is that an economy dependent on a single product (or a small number of products) for export is bound to experience high volatility as the relative price of the product fluctuates in world markets. Since oil is highly volatile, the real income of the oil economies has similarly been highly volatile.

The economic decline in postcommunist countries is even more of a special case. These countries have experienced a one-time decline in GDP per capita as they changed over from a failed communist system to a market economy. Even in the cases of the strongest of the so-called transition economies—the Czech Republic, Hungary, and Poland—there was a period of sharp reduction in GDP per capita for a few years as old heavy industries linked to the Soviet economy declined or disappeared in bankruptcy and new sectors took time to develop. The result was what economists called a transition recession. By the late 1990s, the postcommunist countries had resumed economic growth, but from a lower GDP per capita than before the Soviet collapse.

### Why Some Poor Countries Grew and Others Declined

Poor countries have a significant chance of falling into a poverty trap. Out of the fifty-eight nonoil countries with per capita incomes below $3,000, twenty-two (or 38 percent) experienced an outright decline. Yet the thirty-six other countries enjoyed economic growth. How is it that some very poor countries escaped the ravages of a poverty trap while the rest did not? Comparing those countries that made it and those that did not, the success stories show certain characteristics. The most important determinant, it seems, is food productivity. Countries that started with high cereal yields per hectare, and that used high levels of fertilizer input per hectare, are the poor countries that tended to experience economic growth. Countries that began with very low yields in 1980 are the countries that tended to experience economic decline between 1980 and 2000. Figure 2 illustrates this point: among low-income countries, high cereal yields in 1980 (measured on the horizontal axis) are associated with high economic growth rates (measured on the vertical axis).
The poverty trap is mainly a rural phenomenon of peasant farmers caught in a spiral of rising populations and stagnant or falling food production per person.

The biggest difference between Africa and Asia is that Asia has had high and rising food production per capita during recent decades, whereas Africa has low and falling food production per capita. The Asian countryside is densely populated, with a relatively extensive road network that can carry fertilizer to the farms and farm output to the markets. Farmers use fertilizers and irrigation, and food yields are high. Donor agencies gave ample support to the development of new high-yield varieties in Asia. Under these conditions Asian farmers were able to adopt high-yield crop varieties that produced the famous Green Revolution of rising food production per farmer. The African countryside is much less densely populated, with an absence of roads to transport fertilizers and crops. Farmers do not use fertilizer on food crops, and depend on rainfall rather than irrigation. Donors have woefully underfunded the scientific efforts toward improved varieties appropriate for African conditions. Under these much harsher conditions, Africa's farmers were not able to benefit much, if at all, from the Green Revolution development of high-yield varieties of food crops. Although both Asia and Africa were very poor in 1980, Asian agriculture was significantly outperforming African agriculture, as shown in table 3. This performance has provided a platform for Asia's extraordinary growth since then.

There are other tendencies apparent in the data. The Asian countries that experienced growth started in 1980 with better social conditions: higher literacy, lower infant mortality, and lower total fertility rates. They were, therefore, less prone to fall into a demographic trap of rapidly rising populations pressing on a limited amount of farmland. Once again, the Asian peasants were somewhat better off than their African counterparts. Another tendency is that poor countries with large populations seem to have done better than poor countries with smaller populations. The larger population probably increased the size of the domestic market, making it more appealing to foreign and domestic investors. Perhaps it was easier to introduce key infrastructure such as roads and power supplies in countries with larger populations, since these infrastructure networks are characterized by large initial costs of construction that are more easily financed by larger and more densely populated economies.

The poverty trap of the poorest countries is less puzzling, in some ways, than the stagnation that gripped a number of countries in Central and South America during the 1980s and 1990s. Table 2 shows that countries like Ecuador, Guatemala, Paraguay, and Peru experienced outright economic declines. These are not, in general, destitute countries, though they have destitute populations within them. How can we account for their development failures?

I take up that question in more detail later. It will suffice here to note three characteristics of these economies. First, all of these economies face particular geographical difficulties. Ecuador and Peru are Andean countries, with populations divided between a lowland tropical environment and a mountainous highland environment. Transport conditions are hazardous and expensive. Paraguay, of course, is landlocked. Guatemala is a mix of mountains and low-lying tropical rain forests. Second, the Central American and Andean societies suffer from sharp social divisions, typically along ethnic lines. The European-descended population tends to be much richer than the indigenous and mestizo (mixed) populations. Europeans conquered the native populations, repressed them in many ways, and were generally uninterested in investing in their human capital until very recently. Politics have therefore been highly conflict laden and often violent. Third, these countries are all vulnerable to extreme external shocks, both natural and economic. Natural hazards include earthquakes, droughts, floods, and landslides. Economic hazards
include the huge instabilities in international prices for the leading commodity exports of these countries, such as copper, fish meal, coffee, bananas, and other agricultural and mining products.

CONTINUING EXTREME POVERTY IN THE MIDST OF ECONOMIC GROWTH

Even among the poor countries in Asia that experienced marked economic growth, extreme poverty often continues to afflict significant parts of the population. Economic growth is rarely uniformly distributed across a country. China’s coastal provinces, linked to world trade and investment, have grown much more rapidly than the hinterland to the west of the country. India’s southern states, also deeply integrated in world trade, have experienced much faster economic development than the northern regions in the Ganges valley. Thus, even when average economic growth is high, parts of a country may be bypassed for years or decades.

Another reason for persistent poverty is the failure of government. Growth may enrich households linked to good market opportunities, but it may bypass the poorest of the poor even within the same community. The very poor are often disconnected from market forces because they lack the requisite human capital—good nutrition and health, and an adequate education. It is vital that social expenditures directed at human capital accumulation reach the poorest of the poor, yet governments often fail to make such investments. Economic growth enriches households, but it is not taxed sufficiently to enable governments to increase social spending commensurately. Or even when governments have the revenue, they may neglect the poorest of the poor if the destitute groups are part of ethnic or religious minorities.

A third possible reason for continued poverty in the midst of growth is cultural. In many countries, women face extreme cultural discrimination, whether or not those biases are embedded in the legal and political systems. In South Asia, for example, there are an overwhelming number of case studies and media reports of young women facing extreme undernutrition within the household even when there is enough to go around. The women, often illiterate, are poorly treated by in-laws and lack the social standing and perhaps legal protections to ensure their own basic health and well-being.

In short, there are myriad possibilities for the persistence of poverty even in the midst of economic growth. Only a close diagnosis of particular circumstances will allow an accurate understanding. Policy makers and analysts should be sensitive, however, to geographical, political, and cultural conditions that may each play a role.

THE GREATEST CHALLENGE: OVERCOMING THE POVERTY TRAP

When countries get their foot on the ladder of development, they are generally able to continue the upward climb. All good things tend to move together at each rising rung: higher capital stock, greater specialization, more advanced technology, and lower fertility. If a country is trapped below the ladder, with the first rung too high off the ground, the climb does not even get started. The main objective of economic development for the poorest countries is to help these countries to gain a foothold on the ladder. The rich countries do not have to invest enough in the poorest countries to make them rich; they need to invest enough so that these countries can get their foot on the ladder. After that, the tremendous dynamism of self-sustaining economic growth can take hold.

Economic development works. It can be successful. It tends to build on itself. But it must get started.
The rich world dominates the training of Ph.D. economists, and the students of rich-world Ph.D. programs dominate the international institutions like the International Monetary Fund (IMF) and the World Bank, which have the lead in advising poor countries on how to break out of poverty. These economists are bright and motivated. I know. I have trained many of them. But do the institutions where they work think correctly about the problems of the countries in which they operate? The answer is no. Development economics needs an overhaul in order to be much more like modern medicine, a profession of rigor, insight, and practicality.

In some ways, today’s development economics is like eighteenth-century medicine, when doctors used leeches to draw blood from their patients, often killing them in the process. In the past quarter century, when impoverished countries have pleaded with the rich world for help, they have been sent to the world’s money doctor, the IMF. The main IMF prescription has been budgetary belt tightening for patients much too poor to own belts. IMF-led austerity has frequently led to riots, coups, and the collapse of public services. In the past, when an IMF program has collapsed in the midst of social chaos and economic distress, the IMF has simply chalked it up to the weak fortitude and ineptitude of the government. Finally, that approach is beginning to change. The IMF, thank goodness, is searching for more effective approaches vis-à-vis the poorest countries.

It has taken me twenty years to understand what good development economics should be, and I am still learning. Fortunately for me, and for the countries where I have worked, I realized from the very start of my advisory activities that my formal training was not adequate to the task. While I had learned an important set of tools in my advanced studies, I had not learned the contexts in which to apply them. I had also been led to believe that the standard economics tools were adequate if they were properly used. It took me a long time to understand the urgent need to bring additional tools and procedures to bear if impoverished and crisis-struck countries are to surmount their difficulties.

I propose a new method for development economics, one that I call clinical economics, to underscore the similarities between good development economics and good clinical medicine. On numerous occasions during the past twenty years, I have been invited to take on an economics patient—a crisis-ridden economy—in order to prescribe a course of treatment. Over the years I have marveled at how that experience is akin to that of my wife Sonia’s clinical practice of pediatrics. I have watched in awe, often in the middle of the night, how she approaches a medical emergency or complicated case with speed, efficacy, and amazing results. Development economics today is not like modern medicine, but it should strive to be so. It can improve dramatically if development economists take on some of the key lessons of modern medicine, both in the development of the underlying science and in the systematization of clinical practice, the point where science is brought to bear on a particular patient.

SOME LESSONS OF CLINICAL MEDICINE

A doctor is called in the middle of the night. A child has spiked a high fever. What to do? This is akin to a call I received in mid-1985, when Bolivia had spiked the high fever of hyperinflation. Medical science and practice offer a set of rigorous procedures for addressing the fever. There are five main lessons of clinical medicine relevant to clinical economics.

Lesson 1 is that the human body is a complex system. Ancient Greek medicine talked about illness resulting from an imbalance of the four bodily fluids. Perhaps this was a good stab at matters more than two thousand years ago, but we know much better today. The human body involves biological and biochemical processes of incredible complexity. The division of human physiology into a large number of interconnected systems—nervous, circulatory, respiratory, digestive, endocrine,
immune, reproductive, and so forth—just scratches the surface of the underlying biological processes. The sources of disease can involve infectious agents, environmental hazards, genetic abnormalities, and malnourishment, among other causes, and complex combinations of these factors.

The complexity of the human system has many implications beyond the mere fact that lots of things can go wrong. Most important, one failure can lead to a cascade of additional failures. A fever resulting from an infectious agent can lead to brain seizures caused by the fever rather than the infection itself. Heart failure can result in kidney failure, which in turn can lead to liver failure as the kidney fails to remove certain dangerous toxins from the body. A loss of blood can cause virtually every system to fail as the body falls into shock. Emergency room doctors must struggle to keep each basic system functioning at a minimum level, not only for its own sake but also to prevent a downward spiral of catastrophes that shut down other critical systems. Once that downward spiral starts, it might be hard to reverse, so complex and rapid are the interconnected failures.

Lesson 2 is that complexity requires a differential diagnosis. A doctor seeing a child with a high fever for the first time knows that fevers can be caused by many different factors. The doctor’s first impulse is to find out which is the cause in the particular case. Some causes of fever are dangerous; others are not. Some are treatable; others are not. Some require urgent attention; others do not (except, perhaps, to raise the comfort level of the child). Fevers may result from various kinds of infection (bacterial, fungal, viral, protozoan), trauma, autoimmune disease, cancers, poisoning, and other causes. Since fever is a symptom, rather than a specific disease, a proper course of treatment requires the doctor to identify the true underlying cause of the symptom.

The doctor works through a checklist to get to the right answer. My wife may ask an hour of questions, and then prescribe a battery of laboratory tests before passing along any judgment. On other occasions, the cause can be pretty clear. An earache accompanying the fever is a pretty good giveaway that the underlying condition is the common otitis media (ear infection), especially if the child’s older sibling had an earache earlier in the week, since that particular malady travels rapidly among children in classrooms and families. The doctor’s checklist is not randomly ordered. There are a few principles that determine the order in which the doctor proceeds with an investigation. First, confronted with
tial account of the true underlying reasons for illness. Only careful monitoring, evaluation, testing, and retesting can ensure a safe passage to health in many cases. Good clinicians therefore hold each diagnosis not as sacrosanct, but as the best-maintained hypothesis of the moment. The hypothesis might well be confirmed, but the doctor is prepared to shift ground if the evidence calls for a new approach.

Lesson 5 is that medicine is a profession, and as a profession requires strong norms, ethics, and codes of conduct. The Hippocratic oath is not a mere curiosity to remind doctors of the ancient lineage of their profession. Even if it is not read literally, and after two thousand years it should not be, the oath underscores the ancient lineage of their profession. Even if it is not read literally, and after two thousand years it should not be, the oath underscores to all newly trained doctors that they have entered a hallowed occupation, a great and distinctive calling with very high ethical responsibilities. The doctor has a unique relationship with a patient, one that gives the doctor an entry into the most private conditions of an individual and family. The doctor literally has life and death sway, and it is not hard to take advantage of that sway for money or other forms of personal gain. The oath reminds doctors that they must not abuse the privilege of their positions. They must offer judgments in the interests of the patient, not for personal gain. And they must keep abreast of new scientific findings, including new procedures and medicines, to ensure the highest quality care that they can manage.

DEVELOPMENT ECONOMICS

AS CLINICAL ECONOMICS

The challenge of making policy recommendations for an economy, especially a poor and unstable economy, shares many of the challenges of clinical medicine. Yet the practice of development economics is not yet up to the task. Economists are not trained to think like clinicians, and are rarely afforded clinical experience in their advanced training. A graduate student in an American Ph.D. program in economics may very well study the development crisis in Africa without ever setting foot in the country or countries under study. An adviser may hand over a data set, say for Nigerian households, and ask the student to do a statistical analysis without the benefit of context, history, or direct observation. Years later, the student may have the opportunity to show up in Nigeria for the first time.

The five key lessons of clinical medicine have clear counterparts in good economics practice as well. First, economies, like individuals, are complex systems. Like the circulatory, respiratory, and other systems of a human being, societies have distinct systems for transport, power, communications, law enforcement, national defense, taxation, and other systems that must operate properly for the entire economy to function appropriately. As with a human being, the failure of one system can lead to cascades of failure in other parts of the economy. When the U.S. government asked Bolivia to eradicate its peasants’ coca crops in the late 1990s, the result was a deepening of rural poverty. When the Bolivian government sought to respond to the rising rural poverty with social and development programs, the crisis became a fiscal crisis. When outside donor agencies, including the U.S. government, failed to help Bolivia with the fiscal crisis, the crisis became one of civil disorder, with the police, army, and peasants battling in the streets. Eventually the government was toppled, and Bolivia entered a new period of extended instability.

Second, economists, like medical clinicians, need to learn the art of differential diagnosis. Medical pathology textbooks are now often two thousand pages, and even those may cover just one of the key physical systems. Doctors know that lots of things can go wrong, and that a particular symptom such as high fever might reflect dozens, or hundreds, of underlying causes. The IMF, by contrast, has focused on a very narrow range of issues, such as corruption, barriers to private enterprise, budget deficits, and state ownership of production. It has also presumed that each episode of fever is just like the others, and has trotted out standardized advice to cut budgets, liberalize trade, and privatize state-owned enterprises, almost without regard to the specific context. The IMF has overlooked urgent problems involving poverty traps, agronomy, climate, disease, transport, gender, and a host of other pathologies that undermine economic development. Clinical economics should train the development practitioner to hone in much more effectively on the key underlying causes of economic distress, and to prescribe appropriate remedies that are well tailored to each country’s specific conditions. When in Afghanistan or Bolivia, the IMF should think automatically about transport costs; when in Senegal, attention should turn to malaria.

Third, clinical economics, like clinical medicine, should view treatment in “family” terms, not just individual terms. It is not enough to tell Ghana to get its act together if Ghana faces trade barriers in interna-
tional markets that prevent it from selling its goods and services to world markets; if Ghana is burdened by an unpayable mountain of debt inherited from previous decades; if Ghana requires urgent investments in basic infrastructure as a precondition for attracting new investors; if Ghana is burdened by refugee movements and disorders emanating from neighboring countries. In short, for the IMF and World Bank to tell Ghana to liberalize its trade, balance its budget, and attract foreign investors may be fine and good, but it will be ineffectual if not combined with trade reforms in the rich countries, debt cancellation, increased foreign financial assistance for investments in basic infrastructure, and support to the West African region as a whole to maintain peace. In the case of a country, the entire world community is part of the family. That is an assumption of the Millennium Development Goals, and especially the concept of a global partnership to achieve the goals, but it is not yet part of real clinical practice.

Fourth, good development practice requires monitoring and evaluation, and especially a rigorous comparison of goals and outcomes. When goals are not being achieved, it is important to ask why, not to make excuses for past advice. Under current development practice, the IMF and World Bank have rarely taken on specific development objectives as the standards for judging country performance, and by extension, their own advice. Instead, countries are judged on the basis of policy inputs, not outputs. A government may be told to cut its budget deficit by 1 percent of GDP. It is judged on whether or not it carries out that measure, not on whether the measure produces faster growth, or a reduction of poverty, or a solution to a debt crisis. The result is a descent into formalistic debates on whether or not a particular policy has been carried out, not on whether the policy was the right one in the first place. The current situation reminds me too much of the fable of the farmer whose chickens are dying. The local priest gives one remedy after another—prayers, potions, oaths—until all of the chickens are dead. "Too bad," says the priest, "I had so many other good ideas."

Fifth, the development community lacks the requisite ethical and professional standards. I am not suggesting that development practitioners are corrupt or unethical; such cases are rare. Rather, the development economics community does not take on its work with the sense of responsibility that the tasks require. Providing economic advice to others requires a profound commitment to search for the right answers, not to settle for superficial approaches. It requires a commitment to be thoroughly steeped in the history, ethnography, politics, and economics of any place where the professional adviser is working. It also requires a commitment to give honest advice, not only to the country in question, but to the agency that has hired and sent the adviser. Not every problem facing the impoverished world is homegrown, nor will all solutions be found in good governance, belt tightening, and further market reforms. True solutions will also require deeper debt relief, greater development assistance, more open trade with the rich countries, and the like. Any IMF or World Bank official, as well as any academic development practitioner, has the responsibility to speak truth not only to the policy makers within the impoverished country, but to the policy makers of the rich and powerful countries as well.

WHERE ECONOMIC DEVELOPMENT PRACTICE HAS GONE WRONG

Clinical economics is needed to replace the past twenty years of development practice, known widely as the structural adjustment era. This era, ushered in by the conservative turn in the United States under President Ronald Reagan and in the United Kingdom under Prime Minister Margaret Thatcher, was based on a simplistic, even simpleminded, view of the challenge of poverty. The rich countries told the poor countries: "Poverty is your own fault. Be like us (or what we imagine ourselves to be—free market oriented, entrepreneurial, fiscally responsible) and you, too, can enjoy the riches of private-sector-led economic development." The IMF-World Bank programs of the structural adjustment era were designed to address the four maladies assumed to underlie all economic ills: poor governance, excessive government intervention in the markets, excessive government spending, and too much state ownership. Belt tightening, privatization, liberalization, and good governance became the order of the day.

There were some truths in the structural adjustment agenda. Many poor countries that had fallen into economic crisis by the early 1980s were there as a result of profound economic mismanagement. Too many countries had chosen closed trading systems. The second world and third world strategies had failed, and needed to be reoriented to a global, market-based international economic system. But the policy and governance problems in the poorest countries were only part of the
story, and in many places not the central part. It should have been possible to tend to the problems of closed trading systems and excessive nationalization of industry without ignoring the problems of malaria and AIDS, mountain geographies, and inadequate rainfall. But alas, such a multifaceted approach did not enter the policy debate until very recently.

Sadly, there were self-serving and ideological aspects of the structural adjustment era’s failures of advice and insufficient help. The self-serving aspect is clear. The responsibilities for poverty reduction were assumed to lie entirely with the poor countries themselves. Increased foreign financial assistance was deemed not to be needed. Indeed, foreign aid per person in the poor countries plummeted during the 1980s and 1990s. Aid per person in sub-Saharan Africa, for example, expressed in constant 2002 dollars, fell from $32 per African in 1980 to just $22 per African in 2001, during a period in which Africa’s pandemic diseases ran rampant, and needs for increased public spending were stark. Donors thought they had done everything they could, with any remaining problems caused by issues beyond their responsibility.

The ideological aspects of the advice are plain enough. Conservative governments of the United States, United Kingdom, and elsewhere used international advising to push programs that found no support at home. Many African countries have heard an earful from the World Bank over the past two decades about privatizing their health services, or at least charging user fees for health and education. Yet most of the high-income-country shareholders of the World Bank have health systems that guarantee universal access, and all have education systems that ensure access to public education.

DIFFERENTIAL DIAGNOSIS FOR POVERTY REDUCTION

The Millennium Development Goals (MDGs) offer the world a chance to do better vis-à-vis the poorest countries after twenty years of failed structural adjustment policies. The MDGs state real goals that provide not only benchmarks for aid but also milestones for assessing the advice of the international agencies as well. The failures to meet the MDGs are failures of the rich countries as well as the poor, since both are responsible for their success. The fact that the MDGs are not being met throughout Africa, the Andean region, and Central Asia tells us that the problems are more than simply those of governance. Many governments in these regions have shown boldness, integrity, and intelligence. Yet development continues to fail. A clinical economics approach will point the way to a better strategy.

The key to clinical economics is a thorough differential diagnosis, followed by an appropriate treatment regimen. In the course of a physical exam, the doctor runs through pages of questions: “Are you taking medications?” “Do you have allergies?” “Have you been operated on recently?” “Do you have a family history of the following diseases?” The clinical economist must do the same. In table 1, I describe a seven-part diagnostic checklist that should be part of the “physical exam” of any impoverished country.

The Extent of Extreme Poverty

The first set of questions involves the extent of extreme poverty. The clinical economist should make a set of poverty maps, using available or newly commissioned household surveys, geographic information systems data, national income accounts, and other information. What proportion of households live in extreme poverty? What proportion of households lack access to basic needs in schooling, health care, water and sanitation, electricity, roads, nutrition? What is the spatial distribution of poverty? Is poverty mainly urban or rural, and is it concentrated in a few regions or distributed evenly throughout the country? How does poverty relate to demographic conditions of the household (female- or male-headed household, number of children, health of household members) and to its asset ownership and economic activities (landless poor, smallholder farmer, commerce, industry, and so on)?

In the course of mapping poverty, the clinical economist should also identify key risk factors that may exacerbate poverty in the coming years. What are the demographic trends (births, deaths, internal and international migration) that may affect the numbers and distribution of the extreme poor? What environmental shocks and trends (sea level changes, coastal erosion, deforestation, land degradation, depletion of water aquifers, biodiversity loss) might impinge on poverty? What climate shocks (El Niño, long-term warming, chronic drought, extreme weather events) are likely to affect public health, disease, and agricultural productivity? What changes in infectious disease incidence and prevalence may weigh on the national or regional economies?
might world-market fluctuations in key commodities affect extreme poverty and prospects for economic growth?

Economic Policy

The second set of questions involves the economic policy framework. These are more traditional questions, but they should be addressed systematically. What is the cost of doing business in the country (and in different regions within the country)? What is the coverage of key infrastructure (power, water, roads, transport services), focusing on subnational regions, both urban and rural, as well as national averages? How are costs affected by the lack of infrastructure? What is the trade policy framework, and how are trade barriers impinging on the costs of production, especially for export-oriented businesses? What are the incentives in place for potential domestic and foreign investors, and how does the incentive system compare with the incentives in place in competitor countries? Is the government investing adequately in human capital through programs on nutrition, public health, disease control, education, and family planning?

The Fiscal Framework

The third set of questions homes in on the fiscal framework, since the budget must carry much of the burden of key investments in infrastructure and social services. What are the current levels of budget spending and public revenues? These should be measured both as a percent of GDP and in dollars per person. The share of public spending in GDP in various categories (health, education, infrastructure) gives a sense of the level of effort that a country is making to reduce poverty. The absolute spending, in dollars per person, gives a sense of the adequacy of the spending to ensure basic needs and to support the escape from a poverty trap. To what extent is the government hampered by an overhang of public sector debt inherited from the past? How much would debt relief contribute to the capacity of the government to expand public services? Are there hidden or off-balance-sheet lines on the public sector, such as debts of the central bank, or hidden losses of the commercial banking system that will have to be covered by the government’s budget?
Physical Geography and Human Ecology

The fourth category of questions involves the physical geography and human ecology (meaning the interface of society with the physical environment). Economists are surprisingly untrained in this area, despite its fundamental importance in diagnosing and overcoming extreme poverty. What are the transport conditions in the country, on average and by subregion? How much of the population is proximate to seaports and airports, navigable rivers, paved roads, and rail services? What are the costs of transporting freight (such as fertilizers, food crops, machinery, industrial products) within the country and internationally, and how do those costs compare with competitor countries? What is the distribution of population between coastal and interior areas, rural and urban settlements, and densely and sparsely populated areas? How does population density in various parts of the country affect the costs of infrastructure, for example bringing the population into road, rail, power, and telecom grids?

How are agronomic conditions affected by the physical environment? What is the length of the growing season, and how does that affect crop choice, nutrition, and income levels? What are the patterns of soils, topography, hydrology, and land use affecting crop yields, suitability for irrigation, and costs of land improvements? How are agronomic conditions affected by interannual climate variability linked, for example, to the El Niño fluctuations? How are agronomic conditions affected by long-term trends such as global warming and changes in precipitation patterns, like the evident decline in rainfall in the African Sahel?

How are ecosystem functions changing, and perhaps degrading, over time? Is deforestation threatening the functioning of ecosystems (for example, by exacerbating flooding and land degradation) and the livelihoods of the poor (for example, by exhausting the supplies of fuel wood)? Is the loss of biodiversity threatening ecosystem functions (for example, by reducing the pollination of agricultural products)? Are invasive species affecting the fertility of the land and fisheries? Is the introduction of toxins into the environment threatening the air and drinking water?

How does the ecology affect the burden of disease and its change over time? Malaria is a disease heavily conditioned by climate and mosquito species. Is malaria transmission epidemic or endemic (year-round), and is it changing over time as a result of population movements and climate change? What are the key patterns of animal disease that may have major effects on agricultural productivity (such as African sleeping sickness, a classic example)? What plant pests and diseases pose the gravest threats to livelihoods, international trade, and human health?

Patterns of Governance

The fifth category of the differential diagnosis involves patterns of governance beyond the specifics of the budget process and detailed economic policies. History has shown that democracy is not a prerequisite for economic development. On the other hand, a regime that is despotic, arbitrary, and lawless will easily destroy an economy. Is there a rule of law, or only the arbitrary command of a dictator? Do the systems of public management—for registering businesses, trading property, defending contracts, bidding for government tenders—work effectively? Are public services such as water and sanitation, power, and basic health and education efficiently provided (given the resources at hand), or are they subject to massive waste and fraud? Is corruption rampant, and at what levels of government? Is the succession of power from one government to the next regularized, or subject to the whim and abuse of the current rulers? Are public services run on behalf of a narrow elite, a subregion of the country, or particular ethnic groups?

Cultural Barriers to Economic Development

The sixth category of issues involves possible cultural barriers to economic development. Is the society torn apart by class, caste, ethnicity, religion, or gender inequity? Do women and girls face severe discrimination in personal rights (for example, sexual and reproductive choices) and access to public services (education, health facilities, family planning services)? Are women deprived either legally or informally of the right to own and inherit property? Can women participate with substantial equality of opportunity in the economy beyond home production? Do cultural norms and practices define limits to the economic opportunities of minority groups? Is interethnic violence rampant? What role, if any, is played by a diaspora, such as the offshore Chinese and Indian communities, in terms of investment, remittances, and social networking?
Geopolitics

The final category of the differential diagnosis involves geopolitics, the country’s security and economic relations with the rest of the world. Is the country part of a security bloc that might define or limit its economic possibilities? Is the country subject to international sanctions, and if so, what are the consequences of the sanctions for economic development? Are there critical cross-border security threats, such as refugee movements, terrorism, or cross-border warfare? Do the contiguous neighbors cooperate regarding cross-border infrastructure? Is there an effective regional trade group, and if so, is it supporting an overall expansion of trade or merely a diversion of trade from nonmembers? What trade barriers in the rich world seriously impede development prospects?

The checklist is long. Answers to these questions cannot be ascertained in a fifteen-minute checkup at a clinic, nor, in practice, can they be addressed by a single international agency like the IMF. The answers must be systematic, continually updated, and put into a comparative framework for sound analysis. Many institutions, both within the low-income countries and internationally, should cooperate to address these diagnostic issues. Not only the IMF and World Bank, but also the specialized United Nations institutions such as the World Health Organization, UNICEF, the Food and Agriculture Organization, and many others, should cooperate in the diagnostics.

EDUCATION OF AN ECONOMIST

A differential diagnosis is the beginning, not the end, of the process. The next steps, of course, are to design programs and institutions to address the critical barriers to poverty reduction that are identified through the differential diagnosis. These strategies will be much more effective if the right questions are asked from the start. Questions, I trust, that will be evident later in this book.

It took me a long time to appreciate the need for a new approach to development economics. I did not have the benefit of hindsight—or a comprehensive diagnostic checklist—when I went on my first economic house call. In fact, when I arrived in La Paz, Bolivia, in July 1985, I had almost no checklist at all. I was there for a specific problem in a specific place. I had no idea that during the trip I would be involved with the very issues that were to become the centerpiece of my research and practical work for the next twenty years. These were issues that, much to my surprise, I had not been truly trained to address.
In the next chapters, I lay out a strategy for ending extreme poverty by 2025. The strategy focuses on the key investments—in people and in infrastructure—that can give impoverished communities around the world, both rural and urban, the tools for sustainable development. We need plans, systems, mutual accountability, and financing mechanisms. But even before we have all of that apparatus—or economic plumbing—in place, we must first understand more concretely what such a strategy means to the one billion-plus people who can be helped. It is the bravery, fortitude, realism, and sense of responsibility of the impoverished and disempowered, for themselves and especially for their children, that give us hope, and spur us on to end extreme poverty in our time.

Together with colleagues from the UN Millennium Project and the Earth Institute, I spent several days in July 2004 in a group of eight Kenyan villages known as the Sauri sublocation in the Siaya district of Nyanza Province, about forty-four kilometers from Kisumu, in western Kenya. We visited farms, clinics, a subdistrict and district hospital, and schools in Sauri and the environs. We met with international organizations working in the region, including ICRAF (the World Agroforestry Center), the UN Development Program, and the U.S. Centers for Disease Control and Prevention. The visit made vivid both why extreme poverty persists in rural areas and how it can be ended.

We found a region beset by hunger, AIDS, and malaria. The situation is far more grim than is described in official documents. The situation is also salvageable, but the international community requires a much better understanding of its severity, dynamics, and solutions if the crisis in Sauri and the rest of rural Africa is to be solved.

The situation is best understood through the voices of Sauri’s struggling residents. In response to an invitation from our group, more than two hundred members of the community came to meet with us one afternoon (see photograph 2). Hungry, thin, and ill, they stayed for three and a half hours, speaking with dignity, eloquence, and clarity about their predicament. They are impoverished, but they are capable and resourceful. Though struggling to survive at present, they are not dispir-
we all rose from a discussion that was distressing, uplifting, and profoundly challenging—challenging, most of all, for the rich world. In places like Sauri, stagnation is a euphemism for decline and early death. Food output per person is falling; malaria is pervasive and increasing; AIDS stalks the community and the region, with adult prevalence on the order of 30 percent, if not higher. Rudimentary springs for collecting water for household use are often dirty, especially later in the day after extensive morning use. An NGO from the UK helped install a few protected water points, but they are too few in number, far from many homesteads, and heavily congested, sometimes yielding little more than a trickle and therefore requiring several minutes to fill a jug. Rapid population growth in the past has made farm sizes small. Fertility rates are around six children per woman, and the villagers have no access whatsoever to family planning and reproductive health services or to modern contraceptives.

I canvased the group on the material conditions of the community, and received very perceptive accounts of the grim situation. Only two of the two hundred or so farmers at the meeting reported using fertilizer at present. Around 25 percent are using improved fallows with nitrogen-fixing trees, a scientific farming approach developed and introduced into Sauri by ICRAF. With this novel technique, villagers grow trees that naturally fix nitrogen, meaning that the trees convert atmospheric nitrogen, which most food crops cannot use directly, into a nitrogen compound that food crops can use as a nutrient. The leguminous (nitrogen-fixing) trees can be planted alongside maize or other food crops. By choosing the right timing for planting and the right combination of trees and crops, the farmer gets a natural substitute for chemical nitrogen fertilizer.

So far, just one fourth of Sauri farmers use the new method. It costs money to introduce the technique and one planting season is lost. Farmers may also need to add some nonnitrogen fertilizers, especially potassium, which is also costly, too costly for the impoverished farmers. All of these additional complications could easily be addressed, and the ICRAF technique could be scaled up throughout the village, if only there were additional financial resources available to ICRAF and the village to jump-start the process.

The rest of the community is farming on tiny plots, often no more than 0.1 hectares, with soils that are utterly exhausted of nutrients, and therefore biologically unable to produce an adequate crop. The soils are so depleted of nutrients and organic matter that even if the rains are good, with yields of around one ton of maize per hectare, the households still go hungry. If the rains fail, the households face the risk of
death from immunosuppression because of severe undernutrition. Stunting, meaning low height for one's age, is widespread, a sign of the pervasive and chronic undernutrition of the children.

The real shocker came with my follow-up question. How many farmers had used fertilizers in the past? Every hand in the room went up. Farmer after farmer described how the price of fertilizer was now out of reach, and how their current impoverishment left them unable to purchase what they had used in the past. A fifty-kilo bag of diammonium phosphate (DAP) fertilizer sells for around 2,000 Ksh (Kenyan shillings) (US$25). At $500 a ton, that is at least twice the world market price. A proper application might require two to four bags per hectare, or $50 to $100 per hectare, a cost vastly beyond what the household can afford. Credits to buy fertilizer are neither available nor prudent for these farmers: a single failed crop season, an untimely episode of malaria, or some other calamity can push a household that has taken on debt into a spiral of unending indebtedness and destitution.

In my mind I started the calculations as the conversation progressed. Scaling up an appropriate combination of agroforestry and chemical fertilizer inputs would cost some tens of thousands of dollars. Yes, the amount was out of reach of the villagers themselves, but would represent a low cost per person in villages like Sauri if donors would rise to the occasion. Fortunately, on this occasion, the Earth Institute was able to respond.

As the afternoon discussion unfolded, the gravity of the community’s predicament became more and more apparent. AIDS is ravaging the village, and nobody has yet had access to antiretroviral therapy. I asked how many households were home to one or more orphaned children left behind by the pandemic. Virtually every hand in the room shot up. I asked how many households were receiving remittances from family members living in Nairobi and other cities. The response was that the only things coming back from the cities were coffins and orphans, not remittances.

I asked how many households had somebody currently suffering from malaria. Around three fourths of the hands shot up. How many used antimalarial bed nets? Two out of two hundred hands went up. How many knew about bed nets? All hands. And how many would like to use bed nets? All hands remained up. The problem, many of the women explained, is that they cannot afford the bed nets, which sell for a few dollars per net, and are too expensive even when partially subsidized (socially marketed) by international donor agencies. How many in the community were using medicine to treat a bout of malaria? A few hands went up, but the vast majority remained down. A woman launched into an explanation that the medicines sell at prices well beyond what the villagers can afford.

A year or so ago, Sauri had a small clinic, as seen in photograph 5. The doctor has since left and the clinic is now padlocked. The villagers explained that they could not afford to pay the doctor and buy the medicines, so the doctor departed. Now they fend for themselves without health care or medicines. When malaria gets bad, and their children fall into anemia-induced tachycardia (rapid heartbeat), gasping for breath in small, ravaged bodies deprived of oxygen-carrying hemoglobin, they rush the child to the subdistrict hospital in nearby Yala. The mothers may carry the children on their backs or push them in wheelbarrows for several kilometers over dirt paths. Yet when we visited the Yala subdistrict hospital on our way from the village, we found a hospital with patients lying on cots in the halls—without running water, an in-house doctor (one visits only two afternoons per week), or even one complete surgical kit.

A few years back, Sauri’s residents cooked with locally collected fuel wood, but the decline in the number of trees has left the sublocation bereft of sufficient fuel wood. The quarter or so households who are using the ICRAF system of improved fallows, based on leguminous trees, have a dedicated supply of fuel wood. Other farmer households do not. Villagers said that they now buy pieces of fuel wood in Yala or Muhanda (both a few kilometers away), a bundle of seven sticks costing around twenty-five shillings (thirty cents). These seven sticks are barely sufficient for cooking one meal. In our meeting with the villagers, I conveyed astonishment at the price, thirty cents per meal, for a community that earns almost no money at all. A woman responded that many villagers had in fact reverted to cooking with cow dung or to eating uncooked meals.

As this village dies of hunger, AIDS, and malaria, its isolation is stunning. There are no cars or trucks owned or even used within Sauri, and only a handful of villagers said they had ridden in any kind of motorized transport during the past year. Only three or four of the two hundred or so said that they get to the regional city of Kisumu each month, and about the same number said that they had been to Nairobi, Kenya’s commercial and political capital, four hundred kilometers away, once
during the past year. There are virtually no remittances reaching the village. Indeed, there is virtually no cash income of any kind reaching the village. Given the farmers’ meager production, farm output must be used almost entirely for the household’s own consumption, rather than for sales in the market. The community has no money for fertilizers, medicines, school fees, or other basic needs that must be purchased from outside of the villages. Around half of the individuals at the meeting said that they had never made a phone call in their entire lives. (Ironically, and promisingly, our own mobile phones worked fine in the village, relying on a cell tower in Yala. Extending low-cost telephony to the village, for example based on a mobile phone shared by the community, would therefore pose no infrastructure problems.)

This year the rains are failing again, another disaster in an increasingly erratic climate, quite possibly a climate showing the increasing effects of long-term man-made climate change emanating from the rich world. The two roof-water harvesting cisterns at the school are now empty, and the farmers fear disaster in the harvest next month. The Kenyan government has already put out a worldwide appeal for emergency aid to fight imminent starvation in several provinces, including Nyanza.

This village could be rescued, and could achieve the Millennium Development Goals, but not by itself. Survival depends on addressing a series of specific challenges: nutrient-depleted soils, erratic rainfall, holoendemic malaria, pandemic HIV/AIDS, lack of adequate education opportunities, lack of access to safe drinking water and latrines, and the unmet need for basic transport, electricity, cooking fuels, and communications. All of these challenges can be met, with known, proven, reliable, and appropriate technologies and interventions.

The crux of the matter for Sauri sublocation can be stated simply and directly:

Sauri’s villages, and impoverished villages like them all over the world, can be saved and set on a path of development at a cost that is tiny for the world but too high for the villages themselves and for the Kenyan government on its own.

African safari guides speak of the Big Five animals to watch for on the savannah. The international development community should speak of the Big Five development interventions that would spell the difference between hunger, disease, and death and health and economic development. Sauri’s Big Five, identified by the villagers as well as by the UN Millennium Project, are

- **Agricultural inputs.** With fertilizers, improved fallows (with ICRAF’s proven technologies), green manures and cover crops, water harvesting and small-scale irrigation, and improved seeds, Sauri’s farmers could triple the food yields per hectare and quickly end chronic hunger. In addition, storage facilities would allow the village to sell the grain over the course of months, rather than all at once, thereby getting more favorable prices. Grain could be protected in locally made storage bins using leaves from the improved fallow species tephrosia, which has insecticide properties. These improvements would be of particular advantage for the women, who do the lion’s share of African farm and household work.

- **Investments in basic health.** A village clinic with one doctor and nurse for the five thousand residents would provide free antimalarial bed nets; effective antimalarial medicines; treatments for HIV/AIDS opportunistic infections (including highly effective and low-cost Bactrim); antiretroviral therapy for late-stage AIDS; and a range of other essential health services, including skilled birth attendants and sexual and reproductive health services.

- **Investments in education.** Meals for all the children at the primary school could improve the health of the schoolchildren, the quality of education, and the attendance at school. Expanded vocational training for the students could teach them the skills of modern farming (for example, using improved fallows and fertilizer), computer literacy, basic infrastructure maintenance (electrical wiring, use and maintenance of a diesel generator, water harvesting, borewell construction and maintenance), carpentry, and the like. With a mere thousand households in Sauri, villagewide classes once a month could train adults in hygiene, HIV/AIDS, malaria control, computer and mobile phone use, and a myriad of other technical and enormously pressing topics. Without doubt, the village is ready and eager to be empowered by increased information and technical knowledge.

- **Power, transport, and communications services.** Electricity could be made available to the villages either via a power line (from Yala or Nyanminia) or an off-grid diesel generator. The electricity would power lights and perhaps a computer for the school; pumps for safe well water; power for milling grain and other food processing, refrigeration, carpentry; charges for household batteries (which could be used for...
household illumination); and other needs. The villagers emphasized that the students would like to study after sunset but cannot do so without electric lighting. A village truck could bring in fertilizers, other farm inputs, and modern cooking fuels (for example, canisters of liquid petroleum gas [LPG], familiar from American backyard barbecues), and take out harvests to the market, transport perishable goods and milk for sale in Kisumu, and increase opportunities for off-farm employment for youth. The truck could rush women with childbirth complications and children with acute complications of anemia to the hospital. One or more shared mobile phones for the village could be used for emergencies, market information, and generally to connect Sauri with the outside world.

- **Safe drinking water and sanitation.** With enough water points and latrines for the safety and convenience of the entire village, women and children of the village would save countless hours of toil each day fetching water. The water could be provided through a combination of protected springs, borewells, rainwater harvesting, and other basic technologies. There is even the possibility of establishing links with an existing large-scale storage tank and pumping station a few kilometers away.

The irony is that the costs of these services for Sauri’s five thousand residents would be very low. Here are some quick guesses, which colleagues at the Earth Institute are refining:

Fertilizers and improved fallows for the five hundred or so arable hectares would be roughly $100 per hectare per year, or $50,000 per year for the community.

A clinic, staffed by a doctor and nurse, providing free malaria prevention and care and additional free basic services other than antiretrovirals, would cost around $50,000 per year. (Antiretrovirals would be provided by the Global Fund to Fight AIDS, TB, and Malaria, the U.S. Emergency Plan, and other programs.) School meals could be paid for communally out of just a small part of the incremental grain yields achieved through the application of fertilizers.

A village truck would be an annual inclusive running cost of perhaps $15,000 per year if amortized over several years (or leased from a manufacturer). Modern cooking fuel for the primary and secondary school students (numbering about a thousand) in the entire sublocaliation would cost an additional $5,000 per year. A few village cell phones and a grain storage facility would add perhaps $5,000 per year, for a total of $25,000 per year.

A combination of protected springs (with improved access), borewells (with pumps), and community taps connected to the large-scale storage system would provide access to water at ten convenient locations and cost around $25,000 dollars.

Electricity could be provided to the school, the nearby clinic, and five water points by a dedicated off-grid generator or by a power line from Yala or Nyanminia for an initial cost of about $35,000. For another $40,000 in initial costs and recurring costs of $10,000, every household could be provided with a battery/bulb assembly to light a small bulb for a few hours every night with the battery charging station connected to the village generator. The annualized costs would be $25,000 per year.

Additional expenses would include scaling up educational activities, various costs of local management, technical advice from agricultural extension officers, and other related delivery services.

My Earth Institute colleagues and I estimated that the combined costs of these improvements would total around $350,000 per year, or roughly $70 per person per year in Sauri, for at least the next few years. The benefits would be astounding: decisive malaria control (with transmission reduced by perhaps 90 percent, judging from recent CDC bednet trials in a neighboring area), a doubling or tripling of food yields per hectare with a drastic reduction of chronic hunger and undernutrition, improved school attendance, a reduction of water-borne disease, a rise in incomes through the sale of surplus grains and cash crops, the growth of cash incomes via food processing, carpentry, small-scale clothing manufacturing, horticulture, aquaculture, animal husbandry, and a myriad of other benefits. With anti-AIDS drugs added to the clinic’s services, the mass deaths from AIDS, as well as the deluge of newly orphaned children, could also be stanched.

Sooner rather than later, these investments would repay themselves not only in lives saved, children educated, and communities preserved, but also in direct commercial returns. Consider the case of fertilizers, which are currently unused, since households lack access to storage, transport, credit, and a financial cushion against the risk of crop failures even if credit is made available. A fertilizer application of $100 per hectare (such as two hundred kilos of DAP), combined with or substituted by improved fallows (as appropriate), could raise crop yields in a
normal season from one ton per hectare to three tons per hectare, with
a marketable value of the increment of roughly $200 to $400 dollars per
hectare, assuming that transport is available and there is a stable price
for the maize crop. In a drought year, fertilizer and/or improved fallows
would mean the difference between harvesting one ton and a failed
crop (with attendant acute hunger, if not starvation). In the first few
years, fertilizers and improved fallows should be given largely for free to the vil-
lagers to boost their own nutrition and health, and to build a small financial cushion. Later on it will be possible to share the costs with the community and, eventually, perhaps in a decade, to provide the ferti-
ilizer and improved fallows on a full commercial basis.

INTERNATIONAL DONORS AND VILLAGES LIKE SAURI

The international donor community should be thinking round the clock about one question: how can the Big Five interventions be scaled up in rural areas like Sauri? With a population of some thirty-three million people, of whom two thirds are in rural areas, Kenya would require annual investments on the order of $1.5 billion per year for its Sauris, with donors filling most of that financing gap, since the national government is already stretched beyond its means. (More precise estimates of cost would have to be worked out in the context of detailed development plans as described in chapter 14.) Instead, donor support to Kenya is around $100 million, or a mere one fifteenth of what is needed. Kenya’s debt servicing to the rich world is around $600 million per year, so its budget is still being drained by the international community, not bolstered by it.

This is all the more remarkable since Kenya is a new and fragile democracy that should be receiving considerable help from its development partners. Kenya, ironically, is also a victim of global terrorism, caught in a war not of its own making. U.S. and Israeli targets on Kenyan soil have been hit in recent years, sending Kenya’s tourist industry into a downward spiral and causing hundreds of deaths of Kenyans and massive property damage.

The UN Millennium Project is working with the government of Kenya to ensure that its poverty reduction efforts are bold enough to achieve the Millennium Development Goals. This strategy will require much greater development assistance and deeper debt cancellation from the rich world to enable Kenya to invest in the Big Five—agriculture, health and education, electricity, transport and communications, and safe drinking water—not only in Sauri villages, but across impoverished rural Kenya. Yet when the Kenyan government recently proposed a national social health insurance fund, the very thing needed to scale up access to basic health care, donors quickly objected rather than jumped at the opportunity to examine how it could actually be accomplished.

The issue of corruption overshadows donor relations with the Kenyan government. Much of the corruption reflects holdouts from the earlier regime of more than two decades, corrupt officials who have not yet been weeded out. Part of the corruption is new and completely avoidable, but only if donors help Kenya to improve the functioning of the public administration, not by moralizing and finger pointing but by the installation of computer systems, published accounts, job training and upgrading, higher pay for senior managers so that they do not have to live off bribes and side payments, continued support for the government’s already major efforts to improve the judicial system, empowerment of local villages to oversee the provision of public services, and some humility on the part of donors. Most donor governments have corruption inside their own governments and even in the provision of foreign aid (which is often linked to powerful political interests within the donor countries). The affliction is widespread, and needs to be attacked systematically and cleverly, but without useless and false moralizing.

Donors should sit down with the government leadership and say, “We’d like to help you scale up the Big Five in Kenya’s villages to enable you to ensure that all of Kenya’s rural poor have access to agricultural inputs, health, education, electricity, communications and transport, and safe water and sanitation. Together, let’s design a budgetary and management system that will reach the villages and ensure a monitorable, governable, and scalable set of interventions across the country. We’re prepared to pay if you are prepared to ensure good governance on such a historic project.” Private international consulting firms could be brought in to help design these systems and to lend credibility to their implementation and performance.

With a little more forethought, donors and governments could take advantage of the crucial fact that villages like Sauri have a group moni-
monitoring and enforcement mechanism automatically built into village life that can help to ensure that aid to the village is well used. Just as experience with group lending in microfinance has been highly successful, projects that empower village-based community organizations to oversee village services have also been highly successful. Recent experiences with village governance in India, based on the panchayats (local councils), are but one notable example. In Sauri, the villagers jumped with eagerness at the invitation to form various committees (schooling, clinics, transport and electricity, farming) to help prepare for the actual investments and to ensure proper governance as they are put into place. Headmistress Omolo, who oversaw the formation of the committees, also ensured that the village women, with their special needs and burdens and even legal obstacles, would be well represented in each of the committees.

If donor officials would join the government of Kenya in meeting with the villagers and brainstorming with government officials, they could come up with dozens of fruitful approaches to ensure that aid actually reaches the villages. We need to be more creative in order to save the lives of millions of people now struggling to survive—and often failing—in the impoverished villages around the world. The donors and the government of Kenya can and should agree on a suitable and bold strategy. Kenya's new democracy, from the national government down to the villages, is prepared to govern the use of international help with transparency, efficiency, and equity if we can get the delivery mechanisms right and invest in the supporting information and reporting technologies.

MEETING WITH THE URBAN POOR: MUMBAI, INDIA

Several thousand miles from Sauri, Kenya, an impoverished community in Mumbai, India, struggles with the urban face of extreme poverty. A group that I met in June 2004 comes from a community that lives near the railway tracks. By near, I do not mean within range of the railway whistle as the train rolls through the city; I mean a community that lives within ten feet of the tracks. It may seem impossible, but the shacks of poster board, corrugated sheet metal, thatch, and whatever else is at hand are pushed right against the tracks, as seen in photograph 6. Children and the old routinely walk along the tracks, often within a foot or two of passing trains. They defecate on the tracks, for lack of alternative sanitation. And they are routinely maimed and killed by the trains.

An energetic and charismatic social worker, Sheela Patel, who left academic research years earlier to work with communities like this one, has brought me to meet the group. She has pioneered the cause of community organization within the very poorest slums, such as those shown in photographs 7 and 8. The NGO that she founded, the Society for the Promotion of Area Resource Centres (SPARC), is our host today. The fifty or so people assembled around the room are mostly women in their thirties and forties, but they look much older after decades of hard physical work and exposure to the elements. They have come to meet with me, and also a group of visitors from Durban, South Africa, who are there to learn about community organization for slum dwellers and squatters.

The overarching theme of our discussion is not latrines, running water, and safety from the trains, but empowerment: specifically, the group is discussing how slum dwellers who own virtually nothing have found a voice, a strategy for negotiating with the city government. In the past few years, this particular group, with SPARC's support, has been negotiating arrangements to relocate away from the tracks to safer ground, in settlements with basic amenities like running water, latrines, gutters, even roads. Thousands have already been relocated, though thousands more wait to find new living quarters.

The notion of large communities of people living within a few feet of the train tracks is startling enough for me this morning. It is, to be sure, a measure of the desperation of the poorest of the poor who arrive in cities to escape rural impoverishment, even famine, and then struggle to establish survivable conditions for themselves and for their children. But I'm even more startled to learn that there is actually a Railway Slum Dwellers Federation (RSDF), which has been organized by the community members, with the aid of SPARC, to negotiate with the municipality and the Indian Railways concerning their needs and interests. In addition to SPARC and the RSDF, a third NGO is represented at the meeting, Mahila Milan (Women Together), which focuses specifically on the needs of women slum dwellers.

As the women begin to talk, the realities of extreme urban poverty and the range of solutions come vividly to the fore. Each woman begins with a kind of testimonial to the power of group action. This testimony
might have seemed staged but for the genuine smiles, calm demeanor, and straightforward, matter-of-fact approach of the group. They explain how they have had no schooling—perhaps two or three years of fitful attendance several decades ago. They cannot read or write, but they know full well that their children need and deserve better. Before they came together in the joint initiative of SPARC, the RSDF, and Mahila Milan, they were resigned to their dreadful circumstances, living in constant danger, noise, disruption, and squalor.

But group action has taught them that in fact they have legal rights within the city and even the possibility of access to public services if they act together. The city government and Indian Railways, for their part, have been only too happy to try to relocate the group away from the railway tracks, since the presence of the slum right up against the track leads to frequent accidents and forces the trains to slow down markedly, raising costs and limiting service. The city and the railway company have learned the hard way that any forcible actions to relocate individual families can trigger an uproar, as occurred in February 2001 when two thousand huts were demolished along the Harbour railway line and the federation mobilized its members to shut down the city's railways.

As in the villages of Sauri, what this community needs are investments in individuals and basic infrastructure that can empower people to be healthier, better educated, and more productive in the workforce. These impoverished families want basic amenities—to live away from the railway tracks, with access to water, sanitation, roads, and even electricity. They will need to have new ration cards for the government-supplied subsidized food and cooking oil in the new neighborhoods where they will live. Their children will need access to a school and clinic. They would like to be able to reach their jobs on public transport or by foot if they are close enough. All are hard workers, earning their meager incomes as maids, cooks, sweepers, guards, launderers, or in other low-skilled, labor-intensive services. The younger and more literate members of the group have actually begun to gain, or regain, basic literacy, empowered and motivated by their political activism. Those who become literate have a chance to find work at two or three times their current salaries, perhaps in the garment factories.

One recent report from the slums of Mumbai and Pune, India, speaks plainly to how the lack of basic infrastructure, in this case safe drinking water, has devastating consequences on the dignity and physical well-being of women:

It is typically women who collect water from public standpipes, often queuing for long periods in the process and having to get up very early or go late at night to get the water. It is typically women who have to carry heavy water containers over long distances and on slippery slopes. It is typically women who have to make do with the often inadequate water supplies to clean the home, prepare the food, wash the utensils, do the laundry and bathe the children. It is also women who have to scrounge, buy or beg for water, particularly when their usual sources run dry. It is important not to underestimate this side of the water burden. There are no compelling international statistics, comparable to health statistics, documenting the labour burdens related to inadequate water provision. It is difficult for those who have never had to rely on public or other peoples’ taps to appreciate how humiliating, tiring, stressful and inconvenient this can be. Not having toilets, or having to wait in long queues to use filthy toilets, carries health risks and is also a source of anxiety.

In many ways, the logistical and investment needs of the squatters will be easier to address than the comparable needs of the villagers in Sauri. Water taps can be provided from the main city pipes. Electricity can be tapped into from the power grid rather than supplied by a standalone generator. In densely populated urban areas, access to schools and clinics can also be easier to arrange. Doctors and nurses abound in Mumbai in comparison with the scarcity of trained medical personnel in rural Kenya. The problems in urban areas revolve around empowerment and finance. How can an impoverished squatter community, without its own land, find a collective voice and the security to raise that voice, and how can the financial burdens be shared among the city government and the slum dwellers in a realistic manner?

With SPARC’s initiative, the new Slum Rehabilitation Act has given added power to the communities: slum-dweller organizations are now legally empowered to act as land developers if they can demonstrate that they have agreements to represent at least 70 percent of the eligible slum dwellers in a particular location. As land developers, the slum-dweller organizations can tap into special municipal programs to gain access to real estate for community resettlement or for commercial development that can finance resettlement elsewhere. SPARC is also negotiating with the Kolkata Municipal Authority to help set up lavatories in Kolkata’s slums, under an arrangement in which the costs of construc-
tion would be borne jointly by the municipality and the slum dwellers, and maintenance would be the responsibility of the slum dwellers' organization.

As Sheela Patel explains, adding an organized slum dwellers' voice at the table will make possible future solutions that were undreamed of in the past. Recently the World Bank has creatively joined the mix, helping to finance some of the upgrading of Mumbai's urban transport based on a major role for the NGOs in the design and implementation of the resettlement programs. The NGOs, for their part, have made important advances in organizing and documenting the community members to facilitate the process. Sheela Patel and her colleagues have said that these programs are "steps on the journey towards citizenship for the urban poor, where rights are translated into reality because of the favorable confluence of a supportive policy environment and grassroots democracy in action."

THE PROBLEM OF SCALE

The end of poverty must start in the villages of Sauri and the slums of Mumbai, and millions of places like them. The key to ending poverty is to create a global network of connections that reach from impoverished communities to the very centers of world power and wealth and back again. Looking at the conditions in Sauri, we can see how far $70 per person can go in changing lives—not as a welfare handout, but as an investment in sustained economic growth. Looking at the conditions in Mumbai, we can see how a stable and safe physical environment for a community can enable its households to get a foothold in the urban economy, one that is already linked to global markets. For a sum similar to that in Sauri, it will be possible to establish that foothold.

The starting points of that chain are the poor themselves. They are ready to act, both individually and collectively. They are already hard working, prepared to struggle to stay afloat and to get ahead. They have a very realistic idea about their conditions and how to improve them, not a mystical acceptance of their fate. They are also ready to govern themselves responsibly, ensuring that any help that they receive is used for the benefits of the group rather than pocketed by powerful individuals. But they are too poor to solve their problems on their own. So, too, are their own governments. The rich world, which could readily provide the missing finances, wonders how to ensure that money made available would actually reach the poor and be an investment in ending poverty rather than an endless provision of emergency rations. This question can be answered by showing how networks of mutual accountability can run alongside the networks of financing.

In short, we need a strategy for scaling up the investments that will end poverty, including a system of governance that empowers the poor while holding them accountable. In each low-income country, it is time to design a poverty reduction strategy that can meet this challenge.
At the most basic level, the key to ending extreme poverty is to enable the poorest of the poor to get their foot on the ladder of development. The development ladder hovers overhead, and the poorest of the poor are stuck beneath it. They lack the minimum amount of capital necessary to get a foothold, and therefore need a boost up to the first rung. The extreme poor lack six major kinds of capital:

- **Human capital**: health, nutrition, and skills needed for each person to be economically productive
- **Business capital**: the machinery, facilities, motorized transport used in agriculture, industry, and services
- **Infrastructure**: roads, power, water and sanitation, airports and seaports, and telecommunications systems, that are critical inputs into business productivity
- **Natural capital**: arable land, healthy soils, biodiversity, and well-functioning ecosystems that provide the environmental services needed by human society
- **Public institutional capital**: the commercial law, judicial systems, government services and policing that underpin the peaceful and prosperous division of labor
- **Knowledge capital**: the scientific and technological know-how that raises productivity in business output and the promotion of physical and natural capital

How to overcome a poverty trap? The poor start with a very low level of capital per person, and then find themselves trapped in poverty because the ratio of capital per person actually falls from generation to generation. The amount of capital per person declines when the population is growing faster than capital is being accumulated. Capital is accumulated, in turn, in a balance of two forces, one positive and one negative. On the positive side is the capital accumulated when households save a part of their current income, or have a part of their income taxed to finance investments by the government. Household savings are either lent to businesses (often through financial intermediaries such as banks) or invested directly in family businesses or equities traded in the market. Capital is diminished, or depreciated, as the result of the passage of time, or wear and tear, or the death of skilled workers, for example, because of AIDS. If savings exceed depreciation, there is positive net capital accumulation. If savings are less than depreciation, the capital stock declines. Even if there is positive net capital accumulation, the question for growth in per capita income is whether the net capital accumulation is large enough to keep up with population growth.
ment investments are able to keep ahead of depreciation and population growth.

In figure 2, the process breaks down into a poverty trap. We start again on the left-hand side, but now with a household that is impoverished. All of its income goes to consumption, just to stay alive. There are no taxes and no personal savings. Nonetheless, depreciation and population growth continue relentlessly. The result is a fall in capital per person and a negative growth rate of per capita income. That leads to still further impoverishment of the household in the future. The figure depicts a vicious circle of falling incomes, zero savings and public investment, and falling capital per person as a result.

The solution is shown in figure 3, where foreign help, in the form of official development assistance (ODA), helps to jump-start the process of capital accumulation, economic growth, and rising household incomes. The foreign aid feeds into three channels. A little bit goes directly to households, mainly for humanitarian emergencies such as food aid in the midst of a drought. Much more goes directly to the budget to finance public investments, and some is also directed toward private businesses (for example, farmers) through microfinance programs and other schemes in which external assistance directly finances private small businesses and farm improvements. If the foreign assistance is substantial enough, and lasts long enough, the capital stock rises sufficiently to lift households above subsistence. At that point, the poverty trap is broken, and figure 1 comes into its own. Growth becomes self-sustaining through household savings and public investments supported by taxation of households. In this sense, foreign assistance is not a welfare handout, but is actually an investment that breaks the poverty trap once and for all.

A Numerical Illustration

Economists like to use numerical models because it helps them to calibrate more specifically how much it will cost to accomplish a particular goal, in this case the goal of breaking a poverty trap. Here's a numerical illustration of how the poverty trap works, and though a bit tedious, it shows how financial planning can be used to identify the overall magnitude of official development assistance that will be needed to end poverty. To keep things simple, I use an illustration based entirely on household savings and investment, without worrying about taxation and public investment.

Suppose that an economy requires $3 of capital for every $1 of annual production. Suppose also that the capital stock depreciates at a rate of 2 percent per year. For each $1 million of capital this year, about $835,000 will remain at the end of a decade, after ten years of depreciation. We'll suppose that the economy currently has 1 million poor people, each with capital of $900. This results in annual income of $300 per person ($900 capital divided by three). The total GNP is therefore $300 million ($300 per person times 1 million people). The population is growing at 2 percent per year, so at the end of the decade there will be about 1.2 million people.

Suppose now that the society is too poor to save. Each year the population lives hand to mouth, consuming whatever meager amount is produced. The starting income of $300 is just barely enough to meet basic needs. At the end of a decade, the capital stock will have partly worn out. Instead of $900 million in capital, there will be only $750 million in capital. In the meantime, the population will have grown from 1 million
to 1.2 million. Instead of $900 of capital per person, there is now only $628 of capital per person ($750 million in capital divided by 1.2 million population). Instead of each person being able to produce $300, each person will now produce only $209 ($628 of capital divided by three). Households will be sinking into extreme poverty, without the income to meet basic needs.

In another illustration, suppose now that for whatever reason, the economy begins with the same population, but with a capital stock that is twice as large, equal to $1.8 billion. Per capita income is also twice as large, $600 per capita. As before, households need $300 per person per year to meet their basic needs, and do not save anything out of incomes of $300 or below. On all income above $300 per person, they save 30 percent. Thus a household earning $600 per capita saves 30 percent of $300 ($600 income minus $300 basic needs), or $90 in annual saving. Economywide saving is therefore $90 million.

This year, the capital stock is $1.8 billion, or $1,800 per capita. What about next year? I have assumed that 2 percent of this year’s capital stock, or $36 million, will depreciate by next year. But there is also new savings of $90 million. The net change of the capital stock is a rise of $54 million ($90 million minus $36 million). Next year’s capital stock is therefore $1.854 billion ($1.8 billion plus $54 million). This amount of capital produces a GNP of $618 million ($1.854 billion divided by 3). The population also grows by 2 percent, and so stands at 1.02 million. Per capita income is equal to $606 ($618 million divided by 1.02 million). Per capita income has increased by 1 percent (in comparison with $600), and will increase each year through the decade. Actually, the growth rate will rise gradually over time, reaching more than 2 percent per annum toward the end of the decade as household incomes rise further above the $300 threshold of basic needs. If you use a spreadsheet to repeat the calculations for ten years rather than one year, the GNP per person at the end of the decade is $687, up 15 percent during the decade.

Voilà. With the same economic structure as the first economy, but starting with twice the capital stock, the economy grows rather than declines. The reason is that at an income of $600 per person, the economy is wealthy enough to save for the future; at $300 per person, it is not. Therefore, starting at $600 per capita, the economy finds its way onto a sustainable growth path, whereas starting at $300 per capita, the economy sinks into further misery.

This is not all. As capital accumulates from the income base of $600 per person, and the ratio of capital per person increases, not only does the economy grow, but the economy is likely to get an extra boost from
increasing returns to scale of capital. An economy with twice the capital stock per person means an economy with roads that work the year-round, rather than roads that are washed out each rainy season; electrical power that is reliable twenty-four hours each day, rather than electrical power that is sporadic and unpredictable; workers who are healthy and at their jobs, rather than workers who are chronically absent with disease. The likelihood is that doubling the human and physical capital stock will actually more than double the income level, at least at very low levels of capital per person.

A graphic illustration of increasing returns to capital is the case of roads like the one that connects the port at Mombasa, Kenya, with the landlocked countries Uganda, Rwanda, and Burundi. The transport costs on this road are extremely high because the road is in very poor condition on various stretches. From time to time, transport is disrupted entirely when the rains wash away bridges and sections of the road. Suppose that, at some point, around half the road is paved and usable, and the rest is unpaved and impassable, with alternating sections of paved and unpaved roadway. Repairing the missing sections would amount to doubling the kilometers of paved road, but would much more than double the economic benefits of the road, since it would become usable along its entire length. This is an example of a threshold effect, in which the capital stock becomes useful only when it meets a minimum standard.

Thus targeted investments backed by donor aid lie at the heart of breaking the poverty trap. Donor-backed investments are needed to raise the level of capital per person. When the capital stock per person is high enough, the economy becomes productive enough to meet basic needs. Households can thus save for the future, putting the economy on a path of sustained economic growth. In my illustration, foreign aid (over several years) that raises the capital stock from $900 per person to $1,800 per person would enable the economy to break out of the poverty trap and begin growing on its own. It would also enable the economy to benefit from increasing returns to capital.

Without donor funding, alas, the necessary investments simply cannot be financed. No matter how hard a government might try—through taxes, user fees, or privatization—the poor households at $300 per person simply do not have enough income to meet their basic needs and at the same time finance the accumulation of capital. They need the $300 just to eat and provide clothing, shelter, and other basics.

**Differential Diagnosis and Capital Accumulation**

In a simple illustration, or model, as economists call it, it is easy enough to talk about capital as a single item, something that can be doubled or halved fairly straightforwardly. Much of the complexity of real economic strategy, however, is that capital comes in numerous, almost unlimited, forms. Suppose that an economy successfully negotiates an extra $1 billion in foreign aid. Should that go to building roads, or schools, or power plants, or clinics, or to pay doctors, or teachers, or agricultural extension officers? The answer, in general, is yes to all of the above. The mix will differ markedly country by country. At the core of an effective investment strategy is a rigorous differential diagnosis. The differential diagnosis should build on the appropriate division of labor between the public sector and the private sector, as shown in figure 4.

The public sector should be mainly focused on five kinds of investments: human capital (health, education, nutrition), infrastructure (roads, power, water and sanitation, environmental conservation), natural capital (conservation of biodiversity and ecosystems), public institutions, and tax payments.
tional capital (a well-run public administration, judicial system, police force), and parts of knowledge capital (scientific research for health, energy, agriculture, climate, ecology).

The private sector (funded largely through private savings) should be mainly responsible for investments in businesses, whether in agriculture, industry, or services and in knowledge capital (new products and technologies building on scientific advances), as well as for household contributions to health, education, and nutrition that complement the public investments in human capital. Occasionally the public sector will want to provide direct financing for some private-sector activities, for example, to help farmers adopt new technologies, or to help impoverished rural families to start small businesses or buy critical inputs for the farm, or to encourage the start-up of new urban industries. The general lesson of successful economies is that governments are wise to stick mainly to general kinds of investments—schools, clinics, roads, basic research—and to leave highly specialized business investments to the private sector.

Why should government finance schools, clinics, and roads, rather than leave those to the private sector? There are five kinds of reasons, all compelling in the proper context. First, there are many kinds of infrastructure, especially networks like power grids, roads, and other transport facilities—airports and seaports—which are characterized by increasing returns to scale. If left to private markets, these sectors would tend to be monopolized, so they are called natural monopolies. If such capital investments are left to the private sector, the privately owned monopolies would overcharge for their use, and the result would be too little utilization of this kind of capital. Potential users would be rationed out of the market. It is more efficient, therefore, for a public monopoly to provide network infrastructure and set an efficient price below the one that would be set by a private monopolist.

A second category of publicly provided capital goods includes those that are nonrival, when the use of the capital by one citizen does not diminish its availability for use by others. A scientific discovery is a classic nonrival good. Once the structure of DNA has been discovered, the use of that wonderful knowledge by any individual in society does not limit the use of the same knowledge by others in society. Economic efficiency requires that the knowledge should be available for all, to maximize the social benefits of the knowledge. There should not be a fee for scientists, businesses, households, researchers, and others who want to utilize the scientific knowledge of the structure of DNA! But if there is no fee, who will invest in the discoveries in the first place? The best answer is the public, through publicly financed institutions like the National Institutes of Health (NIH) in the United States. Even the free-market United States invests $27 billion in publicly financed knowledge capital through the NIH.

Third, many social sectors exhibit strong spillovers (or externalities) in their effects. I want you to sleep under an antimalarial bed net so that a mosquito does not bite you and then transmit the disease to me! For a similar reason, I want you to be well educated so that you do not easily fall under the sway of a demagogue who would be harmful for me as well as you. When such spillovers exist, private markets tend to undersupply the goods and services in question. For just this reason, Adam Smith called for the public provision of education: “An instructed and intelligent people . . . are more disposed to examine, and more capable of seeing through, the interested complaints of faction and sedition. . . .” Smith argued, therefore, that the whole society is at risk when any segment of society is poorly educated. Natural capital is another area where externalities loom large. Private actions—pollution, logging, overfishing, and the like—can lead to species extinction, deforestation, or other kinds of environmental degradation with serious adverse consequence for the whole society, or even the whole world. Governments therefore have a crucial role to play in conserving natural capital.

Fourth, societies around the world want to ensure that everybody has an adequate level of access to key goods and services (health care, education, safe drinking water) as a matter of right and justice. Goods that should be available to everybody because of their vital importance to human well-being are called merit goods. The rights to these merit goods are not only an informal commitment of the world’s governments, they are also enshrined in international law, most importantly in the Universal Declaration of Human Rights, as follows:

- Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care and necessary social services, and the right to security in the event of unemployment, sickness, disability, widowhood, old age or other lack of livelihood in circumstances beyond his control.
• Everyone has the right to education. Education shall be free, at least in the elementary and fundamental stages. Elementary education shall be compulsory. Technical and professional education shall be made generally available and higher education shall be equally accessible to all on the basis of merit.

Moreover, according to Article 28 of the Universal Declaration, "Everyone is entitled to a social and international order in which the rights and freedoms set forth in this Declaration can be fully realized." A follow-through on commitments to the Millennium Development Goals would mark a major practical application of that article.

Fifth, government will want to help the poorest of the poor not only by providing infrastructure and social investments, but also by providing productive inputs into private businesses if that, too, is required to help impoverished households get started in market-based activities. Thus government might want to provide subsidized fertilizers to subsistence farmers so that they can produce enough to eat or microcredits to rural women so that they can start microbusinesses. Once these households successfully raise their incomes above subsistence, and begin to accumulate savings on their own, the government subsidies can be gradually withdrawn.

At the same time, except in the case of the poorest households, governments generally should not provide the capital for private businesses. Experience has shown that private entrepreneurs do a much better job of running businesses than governments. When governments run businesses, they tend to do so for political rather than economic reasons. State enterprises tend to overstaff their operations, since jobs equal votes for politicians, and layoffs can cost a politician the next election. State-owned banks tend to make loans for political reasons, rather than on the basis of expected returns. Factories are likely to be built in the districts of powerful politicians, not where they can best serve the broader population. Moreover, governments rarely have the in-house expertise to manage complex technologies, and they shouldn't, aside from sectors where the government's role is central, such as in defense, infrastructure, health, and education.

It is one thing to identify the general checklists of public investments and another to apply the checklist to specific contexts. In Sauri, Kenya, and thousands of villages like it, the priorities include the Big Five: agriculture, health, education, infrastructure (power, transport, and communications), and water and sanitation. Natural capital needs bolstering, especially land reclamation, pollution control, and limits on overfishing, logging, and deforestation generally. Support should come both as direct public provision of services and as public support for private capital accumulation via microfinance and provision of critical farm inputs for smallholder farmers.

A distinct package of public investments will be needed in the urban areas. The higher urban population density makes it feasible, and indeed necessary for public health and economic reasons, to reach households through infrastructure grids for water, sewerage, and power. It is often claimed that in urban areas, private markets can provide these infrastructure services on the basis of market prices. This claim typically overlooks the fact that a sizable proportion of low-income households will be unable to purchase their basic needs at market prices, and will therefore require significant subsidies. One successful model for combining a market approach with subsidies is through lifeline-tariff pricing. In this approach, all households (or all poor households, if they are easy to identify) are guaranteed a given supply of free infrastructure services, for example six thousand liters of water per household per month in South Africa's program. Above that amount, the household pays by the meter.

Urban areas are also vulnerable to intense environmental damage, though in ways quite different from rural areas. Urban environmental hazards include outdoor air pollution (especially from fossil fuel combustion), the release of toxic chemicals into the environment from factories, excessive mining of water aquifers, urban garbage, coastal erosion and destruction of fragile marine ecosystems close to urban centers, and the transmission of airborne infectious diseases (such as tuberculosis) in the crowded living conditions of urban slums. These conditions need to be ameliorated by targeted environmental investments, though impoverished cities rarely have the financial means to undertake these investments on their own.

**Why Good Investments Come in Packages**

One of the weaknesses of development thinking is the relentless drive for a magic bullet, the one decisive investment that will turn the tide. Alas, it does not exist. Each one of the six identified types of capital is needed for an effective, well-functioning economy. Each one is needed
to escape the poverty trap. Even more to the point, success in any single area, whether in health, or education, or farm productivity, depends on investments across the board.

Let me focus on child survival to make the point. The solutions for child survival will not be found in the health sector alone, although investing in the health sector is crucial overall. Here are ways that each of the six forms of capital contributes to healthier children and reduced child mortality (the list is hardly comprehensive):

- **Business capital.** Higher household incomes on the farm and in the cities allow households to invest in safer shelter (with screen doors to keep out mosquitoes), piped water, modern cooking fuels, access to doctors, improved diets, and the like.

- **Human capital.** Key human capital investments include nutrition (micronutrient and macronutrient supplementation), health care (immunizations, routine monitoring, emergency interventions, preventative interventions like antimalarial bed nets), family planning (birth spacing and smaller family size), mother’s literacy, and public health awareness.

- **Infrastructure.** This includes safe drinking water and sanitation, power supplies for safer cooking, emergency transport to clinics, and information and communications technology to underpin routine and emergency health services.

- **Natural capital.** Investment in natural capital includes protection against natural hazards such as El Niño-induced droughts, control of disease vectors and pests, conservation of ecosystem services to support crop productivity, and avoidance of toxic wastes in the air and water.

- **Knowledge capital.** Investments here are for improved organizational procedures for fighting epidemic diseases, development of new drugs and immunizations, development and diffusion of improved seed varieties to improve food intake, and low-cost energy sources for the household for food preparation and storage.

- **Public institutional capital.** These investments provide the operation and extension of public health services, nutrition programs, and community participation schemes involving public health.

The same approach would apply in addressing each of the Millennium Development Goals. Fighting hunger, disease, lack of education, environmental degradation, and urban slums all require *packages* of investments to attack these ills from a variety of directions.

**Investing in Technological Capacity**

In both rural and urban areas, increased investments not only increase the amount of capital per person but also the quality of the technology embedded in the capital. A cell phone, or personal computer, or high-yield variety seed brings the latest in science to the benefit of the poor. Yet using these new technologies requires training and technical competence. Even in the poorest societies, primary education alone is no longer sufficient. All school-aged youth should be provided a minimum of nine years of schooling, and most should have more than that. The society as a whole should promote a significant cohort of university-trained graduates. These teachers, medical officers, agricultural extension officers, and engineers will be needed to harness technologies for local use.

Indeed, rapid economic development requires that technical capacity suffuse the entire society, from the bottom up. But how can we accomplish that task in a setting of widespread illiteracy, where most adults have very few years if any of formal education? The trick, I believe, is to train very large numbers of people at the village level in creative and targeted ways, specifically for the main tasks at hand. For example, every village should aim to have a group of village experts, who, like the barefoot doctors of China, have enough formal training to address basic technical needs at the village level.

A literate community health worker, trained for one year, could be taught to prescribe antimalarial medicines, observe patients taking their daily anti-AIDS drugs, distribute and explain the use of antimalarial bed nets, give children medicine for helminthic (parasitic) infections, give immunizations, track the body weight and size of the community’s children, explain the use of oral rehydration solutions, and with colleagues, keep track of all of this. Ideally, the community health worker would be a member of the community selected to be trained for this purpose, so that the problem of attracting a trained worker from outside the village would not arise—not would the problem of brain drain of doctors and nurses, since one year of training would not qualify the individual for a health career outside the village.
Similarly, we could also imagine in each village a community-based agricultural extension worker with much less formal training than a traditional agricultural extension officer. The community-based worker would understand the basics of soil chemistry (measuring the adequacy of nitrogen, phosphorus, potassium, soil pH, and structure) and related soil tests, as well as the basic techniques of agroforestry, seed selection, and water management. One year of training for a high school graduate could suffice. A community-based engineer could similarly be trained in the operation—and routine maintenance—of diesel generators, electrical wiring, hand pumps, road grading, and the village truck.

Villages of several hundred to a few thousand people have an added advantage: the ability to gather together on the village green for discussions of village issues. With some planning, villages around the world could be helped to engage in continuing adult education on issues of pressing, life-and-death concern, such as, for example, how AIDS is contracted and spread, how malaria can be controlled, the role of hygiene in food preparation, the use of fertilizers, and so forth. Such relevant knowledge, if suitably presented, could inform rural societies on a massive scale. The nearly costless production and distribution of CDs and DVDs with educational materials prepared for village discussions could make it easy to disseminate such information.

In addition to training technical workers and educating villagers, national governments should promote scientific research activities as well. It used to be thought that research could be left to the rich countries while poor countries focused on raising their basic education and literacy levels. When India created its Indian Institutes of Technology in the 1950s and 1960s, development experts expressed skepticism that such advanced and rarified educational programs really belonged in such an impoverished country. Decades later we see the remarkable fruit of those investments in scientific research capacity. The institutes not only produced the generation of information technology engineers that are now powering India’s IT boom, but they also created teams of scientists able to harness that technology specifically to meet India’s needs. Dr. Ashok Jhunjhunwala, a professor at the IIT, Chennai, for example, designed appropriate local-loop wireless technology that has helped millions of Indian villagers to get online. In any developing country, similar homegrown technologies will be needed to adapt global processes to local needs in areas ranging from energy production and use, construction, natural hazard mitigation, disease control, and agricultural production.

India and China are both on the verge of technological breakthroughs from technology importers to technology producers and exporters on a large scale. This rise of homegrown high technology will fuel the growth of these countries for decades to come. Similar efforts are needed to create scientific capacity in sub-Saharan Africa and other very low-income regions. The task is particularly difficult, since it is swimming against the powerful current of brain drain. The few scientists trained in Africa go abroad in search of laboratory equipment, colleagues, and grant support. The infrastructure for science—well-financed universities, laboratories, and a critical mass of research funding and collegial support—will have to be built, and just like other infrastructure, this one will require the backing of rich-country donors. They will have to understand the critical importance of investment in higher education alongside primary education.

**EXAMPLES OF SCALING UP IN THE FIGHT AGAINST POVERTY**

The world is filled with pilot projects showing that one intervention or another has proven successful time and again. It has been shown repeatedly that antimalarial bed nets save lives in rural Africa, that anti-AIDS drugs can be administered in low-income settings, and that immunizations can be delivered in the most difficult places in the world, even in the middle of war zones. The main challenge now is not to show what works in a single village or district—though these lessons can be of great importance when novel approaches are demonstrated—but rather to scale up what works to encompass a whole country and even the world.

There are several significant examples of programs that have been scaled up massively to remarkable success. Here are ten dramatic examples that prove the naysayers wrong:

**The Green Revolution in Asia**

The Green Revolution is one of the most important triumphs of targeted science in the past century. Fearing the possibility of massive hunger because of a rapidly rising global population, the Rockefeller Foundation took the initiative in developing and promoting high-yield varieties (HYVs) of staple crops, first in Mexico, and then in Asia and more
broadly elsewhere. The start was in 1944, when the Rockefeller Foundation set up an institute to develop HVWs of wheat for Mexico, under the lead of Dr. Norman Borlaug. Scientific breeding, using crosses of strains brought from Japan after World War II, led to a breakthrough. Mexico went from a large net importer of grain to a significant net exporter between 1944 and 1964. Borlaug then persuaded donors to invest in similar crop-breeding efforts for South Asia, and also helped to introduce the resulting technologies to local crop breeders who successfully developed new strains. As the result of its Green Revolution, India went from eleven million metric tons of wheat production in 1960 to twenty-four million tons in 1970, thirty-six million tons in 1980, and fifty-five million tons in 1990, far outstripping the increase in population. High-yield varieties were similarly developed for other crops and locations through a network of international institutions, such as the International Rice Research Institute in the Philippines and the International Potato Center in Peru.

The Eradication of Smallpox

A concerted global effort ended the scourge of smallpox after thousands of years of epidemics that claimed the lives of hundreds of millions of people. In 1796, Edward Jenner demonstrated the use of a cowpox vaccine to prevent smallpox; that breakthrough provided the technological basis for eventual eradication. By the 1950s, most of the rich world had already become free of smallpox, but the disease continued to rage in poor countries, where vaccine coverage was very low. As recently as 1967, the disease struck around 10 to 15 million people and claimed 1.5 to 2 million lives. That year, the World Health Organization established the Smallpox Eradication Unit, and began to implement a campaign of mass vaccination worldwide, backed by strong efforts on surveillance and containment. In 1980, the World Health Organization declared the world free of smallpox. The campaign had successfully reached the farthest corners of the world, including impoverished regions in the hinterlands of Asia and Africa, and regions in the midst of violent conflict.

The Campaign for Child Survival

In 1982, the executive director of UNICEF, James Grant, launched the Campaign for Child Survival. The campaign promoted a package of interventions known as GOBI: growth monitoring of children; oral rehydration therapy to treat bouts of diarrhea; breastfeeding for nutrition and immunity to diseases in infancy; and immunization against six childhood killers: tuberculosis, diphtheria, whooping cough, tetanus, polio, and measles. As in the smallpox eradication effort, the campaign depended on standardized technologies that could be massively scaled up in low-income settings. During the decade, particularly in the latter years, dozens of poor countries conducted all-out campaigns to introduce these measures, especially to reach at least 80 percent coverage with the immunization package. The results were striking. Child mortality rates fell sharply in all parts of the low-income world, including Africa, where the rates were (and are) by far the highest. The campaign was estimated to have saved around twelve million lives by the end of the decade.

The Global Alliance for Vaccines and Immunization

By the late 1990s, the campaign for childhood immunizations needed fortifying in two major ways. First, many new immunizations had been developed and adopted in the rich countries, but because of costs and lack of training and facilities, they had not been introduced into poor countries. Second, coverage rates achieved by the early 1990s had slipped, often the result of intensifying poverty and economic crisis in sub-Saharan Africa and other regions. Bill Gates stepped up to the effort, announcing an initial gift of $750 million from the Bill and Melinda Gates Foundation to reenergize the effort. The Global Alliance for Vaccines and Immunizations was launched in 2000 to guide the new effort. In the first years of its operation, the alliance made commitments of $1.1 billion to poor countries, and it has achieved a series of striking results. As of 2004, the alliance reported 41.6 million children vaccinated against hepatitis B; 5.6 million children vaccinated against Haemophilus influenzae type b (Hib); 3.2 million children vaccinated against yellow fever; and 9.6 million children vaccinated with other basic vaccines. Once again, its strategy has depended on the coupling of standardized
technologies with systems of mass distribution, in this case based on pro­
posals developed and submitted by the recipient countries.

The Campaign Against Malaria

During the 1950s and 1960s, the World Health Organization launched a
series of efforts directed at eradicating malaria. Sometimes judged to
have been a failure, since malaria was certainly not eradicated, these ef­
forts can be seen as a stunning success for certain parts of the world
where the scourge of malaria was eliminated or brought dramatically
and decisively under control. Well over half of the world’s populations
living in endemic regions in the 1940s were largely freed of malaria
transmission and mortality as a result of WHO’s concentrated efforts,
mainly in the areas where disease ecology favored the control measures.
Africa, alas, was neither part of the program at the time, nor a benefici­
ary of its results until today. The standardized technologies that pro­
duced these regional, if not global, successes were two: the use of DDT
and other pesticides to reduce the transmission of the disease and the
use of chloroquine and other new antimalarial drugs to treat cases of it.
(Now technologies, especially antimalarial bed nets and artemisinin­
combination therapies to treat the disease, combined with DDT where
appropriate, can dramatically reduce the burden of the disease in Africa
but will not eliminate the transmission entirely.)

The Control of African River Blindness

The Onchocerciasis Control Program (OCP) was launched in 1974 as a
collaboration of WHO, the World Bank, Merck, the Food and Agricul­
ture Organization (FAO), and the United Nations Development Pro­
gram (UNDP). OCP aimed to reduce the transmission of African river
blindness (onchocerciasis), a disease transmitted by a species of black
fly. The program adopted a multipronged, scaled-up strategy in eleven
hard-hit countries of West Africa based on a combination of prevention
activities (including airborne spraying of insecticides to reduce the black
fly abundance) and treatment. In the 1980s, Merck and WHO scientists
realized that one of Merck’s drugs used in veterinary medicine, iver­
meectin (Mectizan by trade name), could also effectively treat African
river blindness. Merck agreed to donate ivermectin in a massive effort
to control the disease. The OCP now reports the following accomplish­
ments: an estimated six hundred thousand cases of African river blind­
ness prevented, twenty-five million hectares made safe for settlement
and cultivation, and roughly forty million people protected from dis­
ease transmission. The economic benefits have been significant.

The Eradication of Polio

As there is for smallpox, an immunization technology is also available to
achieve global eradication of polio. There are technical differences be­
tween the two diseases, which make the polio effort a bit harder. Still,
polio eradication is feasible and well on its way to being achieved. In
1988, the World Health Assembly (the governing board of the World
Health Organization), voted to launch the Global Polio Eradication Ini­
tiative. At the time, polio was still endemic in more than 125 countries.
Today, thanks to massive efforts by official institutions such as WHO,
UNICEF, and the U.S. Centers for Disease Control and Prevention, as
well as actions within poor countries and a remarkable and tireless ef­
fort by Rotary International, polio remains in only six countries (Nige­
dia, India, Pakistan, Niger, Afghanistan, and Egypt); and it is being
contained. Only 784 cases were reported worldwide in 2003, compared
with 350,000 in 1988. An estimated two billion children have been im­
uminated since 1988, with the cooperation of twenty million volunteers
and international funding on the order of $3 billion.

The Spread of Family Planning

Modern contraception has contributed to a dramatic reduction in total
fertility rates, from a world average of 5.0 children per woman in the pe­
riod 1950 to 1955 to 2.8 children per woman in the period 1995 to 2000.
Family planning programs have played an enormous role in providing
advice and information, advocating and assisting in the empowerment
of women, and promoting modern contraception, although many other
factors (women’s literacy, women’s entry into the nonfarm labor force,
reduced child mortality, and urbanization) have played important roles.
The United Nations Population Fund (UNFPA) was established in 1969
to help coordinate this effort, and it currently operates in 140 countries.
It has helped to spur a massive increase in the use of modern contracep­
tives among couples in developing countries, rising from an estimated
10 to 15 percent of couples in 1970 to an estimated 60 percent in 2000.
This program has been an example of scaling up par excellence, but the unmet needs are still massive, since funding for contraceptive availability in the poorest countries is far below needed levels.

**Export Processing Zones in East Asia**

To a remarkable extent, the early industrialization of East Asia after World War II depended on a new organizational technology, the Export Processing Zone (EPZ), or free-trade zone. The free-trade zone is an industrial zone (sometimes a whole region or country) in which special tax, administrative, and infrastructure conditions are applied in order to encourage foreign companies to set up export-oriented manufacturing facilities. The general key has been physical security within the zone, ample land for manufacturing operations, easy connections to reliable water and power, low-cost proximity to a seaport or airport, tax holidays on profits, and tax-free imports of inputs and exports of finished products. Free-trade zones have been the basis for East Asia’s leap into global production in garments, footwear, toys, automotive components, electronics, and semiconductors. In almost all cases, the East Asian countries began with very low-skilled, labor-intensive operations (such as the manual assembly of components onto electronics motherboards or the cutting and stitching of fabrics into ready-made garments), and then progressed to higher technology parts of the value chain, including product design. The result was an export boom at national, indeed global, scale. *Asia week* magazine once referred to free-trade zones as “Instant Industry.” Manufactured exports from East Asia rose at an astounding compound rate of 12 percent per annum between 1978 and 2000, or in dollar terms, from $37 billion to $723 billion (in 1995 dollars).

**The Mobile Phone Revolution in Bangladesh**

Bangladesh’s Grameen Bank, already justly famous for its microfinance lending, has also opened the world’s eyes to expanding the use of modern telecommunications technologies in the world’s poorest places. Grameen Telecom went into the business of mobile phones in 1997, reaching half a million subscribers by 2003, roughly equal to the total number of landlines. It used that mainly urban base of operations to launch a village phones program, whereby a village woman borrows funds for a mobile phone that is then used throughout the village at a small charge. With the fees she collects, the woman gradually repays the loan. Grameen estimates that each phone reaches an average of about 2,500 people in the village. With 9,400 villages covered by early 2004, the estimated access would be on the order of 23 million villagers. The model is being widely adopted now in dozens of other countries.

These cases demonstrate some common themes. First and foremost, scaling up is possible when it is backed by appropriate and widely applicable technology, organizational leadership, and appropriate financing. In many cases—such as smallpox or polio eradication—the technologies had long existed, but had not been applied in the poorest settings. In other cases, such as with the high-yield varieties of food crops at the core of the Green Revolution, the appropriate technologies had to be developed and then promoted through a targeted effort. In almost every case, technologies had to be adapted to local conditions (for example, solving the problems in tropical settings of maintaining the “cold chain” for immunizations that must remain cold until used, or adapting crop-breeding technologies to the local conditions of land, climate, and labor).

In the case of the Millennium Development Goals, the promising technologies exist, but have not yet been scaled up. Antimalarial bed nets, just to name one pertinent example, are used by fewer than 1 percent of rural Africans living in endemic malaria regions. It is time for that to change. Next, I consider the operational ways to get the job done.
Ending global poverty by 2025 will require concerted actions by the rich countries as well as the poor, beginning with a “global compact” between the rich and poor countries. The poor countries must take ending poverty seriously, and will have to devote a greater share of their national resources to cutting poverty rather than to war, corruption, and political infighting. The rich countries will need to move beyond the platitudes of helping the poor, and follow through on their repeated promises to deliver more help. All of this is possible. Indeed, it is much more likely than it seems. But it needs a framework. My colleagues and I in the UN Millennium Project have proposed just such a framework, focused on the period until 2015, called the Millennium Development Goals-Based Poverty Reduction Strategy.

A SHADOW PLAY

Today’s situation is a bit like the old Soviet workers’ joke: “We pretend to work, and you pretend to pay us!” Many poor countries today pretend to reform while rich countries pretend to help them, raising the cynicism to a pretty high level. Many low-income countries go through the motions of reform, doing little in practice and expecting even less in return. The aid agencies, on their part, focus on projects at a symbolic rather than national scale, just big enough to make good headlines. In 2002, the United States Agency for International Development (USAID) proudly trumpeted its West African Water Initiative, noting that “a reliable supply of safe water, along with adequate sanitation and hygiene, are on the front line in the combat against water-related disease and death.” Fair enough, but what was USAID’s actual contribution? A pitiful $4.4 million over three years. If West Africa has a population of some 250 million people, $4.4 million over three years would be less than a penny per person per year, enough perhaps to buy a Dixie cup, but probably not enough to fill it with water!

The chronic lack of donor financing robs poor countries of their poverty-fighting zeal. In 2003, Prime Minister Meles Zenawi and I cohosted an event in Addis Ababa to launch the Human Development Report in Ethiopia, one of the world’s poorest countries. The prime minister made a powerful and insightful presentation about Ethiopia’s potential to expand food production, and thereby to overcome pervasive hunger. A question came from the floor. “Mr. Prime Minister, we agree with you on the importance of agriculture, but what about health care?” To my surprise, the prime minister responded, “I’m afraid that health care is going to take more time. We will be able to expand health care only later, once we are richer.” Back in his office, I said that I did not agree with his answer, “Ethiopia needs expanded health care now.” He looked back at me plaintively and agreed. But then he told me that IMF officials had recently told him, “There’s no more money available for health.”

A reasonable estimate, based on the work of the UN Millennium Project, is that Ethiopia needs about $70 per person per year in development assistance (or $5 billion in total for a seventy-million person economy) compared with the $14 per person per year it receives today (or $1 billion in total). About half of that sum would be devoted to the scaling up of public health. The balance would go to infrastructure and raising rural productivity, especially in the food sector.

As soon as I returned to New York from Addis, I telephoned a senior IMF official. “Jeff, what are you complaining about now?” the official said good-naturedly. I repeated the story and noted that Ethiopia lived, in essence, without modern health care, enduring a life expectancy rate of forty-two years, child mortality of 170 for every 1,000 born, a one-third chance of living to sixty-five years, one doctor for every 30,000 people, and public spending on health of $2 per person per year. “So what do you want me to do?” said the official. “I want the IMF to support a major increase of public health spending in Ethiopia.” “But Jeff, there’s no donor money for that.” “The donor world is awfully rich,” I
retorted. "Jeff, the donors are not offering to give more to Ethiopia."
"But then there's absolutely no way for Ethiopia to meet the Millennium
Development Goals." "You're right, those goals are unreachable." Exasperated, I said, "Well, then, at least say that publicly—that Ethiopia will
fail to meet the MDGs unless the donors give more. The world needs to
hear that. Perhaps that would get the donors to move."

We are stuck in a shadow play. In public, the IMF says how well things
are going in Ethiopia; in private, it recognizes that aid for Ethiopia is in­sufficient for the country to achieve the Millennium Development Goals.
The March 2004 IMF–World Bank Joint Staff Assessment of Ethiopia's
Poverty Reduction Strategy (on the IMF's Web site) does not breathe a
word about the need to scale up donor financing significantly if the
MDGs are to be achieved. Even more distressing, but par for the course,
the IMF–World Bank document contains no data whatsoever about the
country's public health emergency. How could the IMF and World Bank
executive directors even know that the country program they have ap­proved cannot even achieve the goals that have been promised?

I believe that the senior IMF official was wrong: there is more money
available for Ethiopia, but only after we cut through the thicket of excuses
and platitudes about aid, some of which the IMF itself propagates. In pub­lic, all of the standard reasons why aid to Ethiopia is at just the right level
are marshaled: Ethiopia is doing fine (says the IMF–World Bank Staff As­sessment), it has all the donor resources it needs, it could not absorb any
more, corruption and mismanagement would undermine greater assis­tance. This is the standard litany of excuses used to justify the status quo.
In private, virtually the entire development community knows that
Ethiopia is starved for cash. Apparently, it is too embarrassing to the polit­ical bosses in the United States and Europe to make the point. This is a
mistake. If we explain patiently and honestly to the taxpayers in the rich
world that more money is needed and can be well used, it is much more
likely to become available.

TWO SIDES OF THE COMPACT

So that I am not misunderstood, let me underscore that a global com­ pact, like any contract, has at least two parties, and therefore responsi­bilities on both sides. Poor countries have no guaranteed right to meet
the Millennium Development Goals or to receive development assis­tance from the rich countries. They only have that right if they them­selves carry through on their commitments to good governance. The
expansion of aid is predicated on a serious plan of action, combined
with a demonstrated will to carry it out in a transparent and honest man­ner. Not all governments will want to, or be able to, make such a commit­ment, and those nations need not apply. Our compact, our commitment,
in the rich countries should be to help all poor countries where the col­lective will is present to be responsible partners in the endeavor. For the
others, where authoritarian or corrupt regimes hold sway, the conse­quences for the population are likely to be tragic, but the responsibili­ties of the rich world are also limited. Perhaps the most important action that
rich countries can take in those circumstances is to help the wel­lgoverned neighbors of such countries to prove that there is help avail­able for those that are organized politically to help themselves. The
biggest problem today is not that poorly governed countries get too
much help, but that well-governed countries get far too little.

PLANNING FOR SUCCESS

Boring as it may seem, we need to fix the "plumbing" of international
development assistance in order to be effective in helping the wel­lgoverned countries. Aid flows through certain pipes—bilateral donors,
the World Bank, the regional development banks (such as the African
Development Bank)—but these pipes are clogged or simply too narrow,
not able to carry a sufficient flow of aid. If we are to get agreement by
the rich world's taxpayers to put more aid through the system, we first
have to show that the plumbing will carry the aid from the rich coun­tries right down to where the poorest countries need it most—in the vil­lages, slums, ports, and other critical targets. Let me describe how that
plumbing can be put right. I focus my attention on the period until
2015, when the Millennium Development Goals are to be met. Similar
principles will apply for the second decade, from 2015 to 2025.

The UN secretary-general, overseeing the UN agencies and the Bret­ton Woods Institutions (which are also part of the UN family), should
oversee the entire effort. Working through the United Nations Develop­ment Program—the economic development arm of the UN system—
the secretary-general, on behalf of the member nations, should ensure
that the global compact is put into operation. Much of the work will
take place at the level of the individual country, where plans will be devised and investments made on the basis of national financial resources and increased donor aid.

To organize country-level work, each low-income country should adopt a poverty reduction strategy (PRS) specifically designed to meet the Millennium Development Goals. Most poor countries today already have some form of a poverty reduction strategy—usually a poverty reduction strategy paper or plan—that it has developed in cooperation with the IMF and World Bank. The existing World Bank poverty reduction plan lays out the country's goals, targets, policies, and strategies to cut poverty. Introduced a few years ago to give more coherence to each country's efforts to fight poverty, and to provide a framework for official debt relief, the existing poverty reduction strategies are not yet designed with enough rigor or ambition to enable the countries to achieve the MDGs.

The poverty reduction strategy papers, incidentally, are all publicly available on the IMF and World Bank Web sites, so one can read for oneself what the countries have deemed to be their poverty reduction strategies. The programs are often ingenious, but are all chronically underfunded compared with what is needed to achieve the Millennium Development Goals. As a result they are often forced to shortchange entire areas of public investment (such as public health). Five recent poverty reduction strategy plans of notable quality in Africa are:

- Ghana's Poverty Reduction Strategy (GPRS)
- Ethiopia's Sustainable Development and Poverty Reduction Program (SDPRP)
- Senegal's Poverty Reduction Strategy Paper (PRSP)
- Uganda's Poverty Eradication Action Plan (PEAP)

Why Today’s System Is Incoherent

Alas, the international community's approach remains incoherent in practice. On the one side, it announces bold goals, like the Millennium Development Goals, and even ways that the goals can be achieved, such as the pledge of increased donor assistance made in the Monterrey Con-
Ghana is one of the best governed and managed countries in Africa. It is a stable, multiparty democracy with relatively high literacy (92 percent of youths aged fifteen to twenty-four) and modest levels of corruption compared with other countries at a comparable income level. Ghana suffers from considerable extreme poverty. Like other African countries, Ghana has been unable to diversify its export base beyond a narrow range of primary commodities, mainly cocoa beans. It lacks the domestic resources needed to finance critical investments in health, education, roads, power, and other infrastructure. It fell into a sharp debt and financial crisis in the early 1980s, and since then the government has been hard pressed to pay its monthly bills, much less to expand the levels of public investment.

The government of Ghana reached these same conclusions when it presented the Ghana Poverty Reduction Strategy (GPRS) in 2002, its version of the poverty reduction plan. Ghana took seriously the Millennium Development Goals and presented a strategy based on the investments that it would need to achieve the MDGs. The plan called for a major scaling up of public investments in the social sectors and infrastructure, estimated to require donor aid of around $8 billion over five years, or roughly $75 per Ghanaian per year during the five-year period. The Ghana strategy was exceptionally well designed and argued, but the donors balked. The first draft was rejected by the donors. The government cut back on its ambitions, and slashed the aid request to just $6 billion over five years. The donors balked again. The plan was slashed again. By the end of this excruciating process, the poverty reduction plan was funded at around $2 billion for the five-year period.

When I was recently in Accra, Ghana, a very pleasant representative of the European Commission said to me, “But Professor Sachs, the original plan was simply not realistic.” “What do you mean by realistic?” I responded. “Do you mean that it was not realistic because the program was poorly designed, or do you mean that it was not realistic because the donors wouldn’t foot the bill?” “Oh, I mean only the latter, Professor Sachs. The strategy was fine, but we couldn’t come close to the $8 billion request.” Realism, it seems, is in the eye of the beholder. I would have thought that the original plan was realistic because it aimed to accomplish the very goals that the world had endorsed. The final plan seemed unrealistic to me, because it can no longer achieve the MDGs. The donors, evidently, meant something else about realism. For the donors, realism meant convenience, and specifically shoehorning Ghana’s financial needs into the tight fit of an insufficient aid package.

Still, I am not despairing. Ghana could soon have a strategy based on the Millennium Development Goals. One reason is that creative work by the World Bank, the UN agencies, and the bilateral donors has actually prepared the plumbing system to handle a much greater flow of resources. Ghana’s donors have already reached important agreements to coordinate (or “harmonize”) their efforts around the Ghana strategy. They have agreed to simplify their own aid procedures, and in fact to pool their financial resources to support the plan.

In the alphabet soup of donor aid, the new donor program for Ghana is called the Multi-Donor Budget Support (MDBS) policy. Under this new arrangement, the donors have agreed to give their money directly to Ghana’s budget so that the government of Ghana can carry out the public investments it has identified as the highest priorities for poverty reduction. In Ghana’s case, a viable development plan (GPRS) and the financial plumbing to support the plan are now in place. What Ghana now needs is an adequate flow of cash. A true MDG-based poverty reduction strategy would have five parts:

- **A Differential Diagnosis**, which identifies the policies and investments that the country needs to achieve the Millennium Development Goals
- **An Investment Plan**, which shows the size, timing, and costs of the required investments
- **A Financial Plan** to fund the Investment Plan, including the calculation of the Millennium Development Goals Financing Gap, the portion of financial needs that the donors will have to fill
- **A Donor Plan**, which gives the multiyear donor commitments for filling the Millennium Development Goals Financing Gap
• A Public Management Plan that outlines the mechanisms of governance and public administration that will help implement the expanded public investment strategy

In combination, these five sections would put to rest the current favorite explanation of donors for not doing more to help the poorest countries: the alleged lack of "absorptive capacity" to use more aid. How can we scale up the health sector, the donors ask, if the countries lack the doctors, nurses, and clinics to provide health services? Such a question misjudges the whole purpose of aid. Sure there are not enough doctors and nurses now. What about in four, or six, or ten years? With more aid, there can be more doctors, nurses, and clinics. Getting from here to there is a matter of routine planning, not heroics.

With a lead time of a couple of years, for example, doctors from the country who have relocated abroad could be attracted home with improved salaries, covered partly by donor aid. Within two or three years, tens of thousands of community health workers could be trained, with the training financed by donor aid. With a lead time of five years, the graduating class of the existing medical schools could be enlarged, with the expenses covered in part with donor aid. And with a lead time of ten years, several new medical schools could be built within the country, with the new schools financed by donor aid. Limited absorptive capacity is not an argument against aid. It is the very reason that aid is needed! The key is to invest that aid over the course of a decade, so that absorptive capacity can be increased step by step in a predictable manner.

In the previous chapter we discussed the essence of the differential diagnosis and the investment plan, specifically the areas of priority investments in infrastructure and social services that can lift a country out of a poverty trap. Let me therefore turn directly to the last three elements of the MDG-based poverty reduction strategy: the financial plan, the donor plan, and the public management plan.

The Financial Plan and Millennium Development Goals Financing Gap

A proper financial plan begins with an estimate of the unit costs of providing the key investments: teachers, classrooms, kilowatt hours of electricity, health clinics, kilometers of road, and so forth, and then examines the increased populations to be covered by these interventions. These costs of scaling up can be estimated with considerable detail, and they should cover not only the capital costs of the projects, but also the costs of operations and maintenance. In the past, donors often have helped countries to build clinics, but then rejected the plea to help cover the salaries of doctors and nurses to staff the clinics. The predictable result has been the construction of empty shells rather than operating health facilities. Donors need to be prepared to finance not only the physical infrastructure, but also the salaries of public-sector workers.

During the structural adjustment era of the 1980s and 1990s, the IMF, World Bank, and donor community often accepted the need for larger funding for health or education, but said that the poor should pay their own way. Similar arguments are heard today concerning the privatization of water and sanitation services. "Yes, let’s mobilize new investments in water and sanitation, but let’s do it through the private sector. The poor can pay for improved services." In some cases, donors have supported a compromise formula called social marketing, in which the poor are asked to pay part, not all, of the cost of the service, with the donors picking up the balance. Social marketing has been applied, for example, to the sale of contraceptives and antimalarial bed nets. These recommendations have failed repeatedly. They have been unrealistic about what the poor can actually afford to pay, which is usually little or nothing. The extreme poor don’t even have enough to eat, much less to pay for electricity or water or bed nets or contraceptives. The history of user fees imposed on the poor is a history of the poor being excluded from basic services.

The financial plan, therefore, must include a realistic picture of what the poor can actually pay and what they can’t pay. The UN Millennium Project, following the similar recommendations of the WHO Commission on Macroeconomics and Health (CMH) recommends that user fees should be dropped entirely for essential health services and primary education in poor countries. As for water, sanitation, and power, the project strongly endorses the use of lifeline tariffs, explained earlier. In that system, every household gets a guaranteed fixed supply of electricity and safe water; above that amount, they pay by the meter.

The financial plan should also estimate the share of GDP in tax revenues that can be devoted to the Millennium Development Goals. Here again realism is vital. Poor countries can only raise limited amounts in taxation. The poor cannot be squeezed by taxes any more than they can be squeezed through user fees. Attempting to raise taxes too high results in widespread evasion and serious economic distortions. When the
Commission on Macroeconomics and Health considered this issue, the IMF representative on the commission suggested that it assume that a low-income country could mobilize an additional 1 percent of GDP in tax revenues for the health sector by 2007 and an additional 2 percent of GDP by 2015. The UN Millennium Project adopted the same approach, assuming that low-income countries can raise an additional 4 percent of GDP by 2015 for all MDG-related investments.

With these assumptions, it is possible to calculate a Millennium Development Goals financing gap, which measures how much the donor community would have to contribute to enable the low-income country to finance the investment plan. The following chapter details these calculations. One point to stress here is that help will be needed not just for a few years, but for most (or all) of the period until 2025. Funding plans cannot realistically expect that poor countries will suddenly pick up the full tab for expanded projects after just a few years. Sustainability of the investment plans will require sustained large-scale donor financing for at least a decade to come, and in many cases for two decades.

The Donor Plan

The donors have put great stress on the need for countries to improve their governance, but much too little stress on how donors themselves need to improve their own performance. As part of every MDG-based poverty reduction strategy, we need a donor plan that spells out in a transparent manner the way that donor commitments will be fulfilled. A donor plan should focus on four aspects of aid flows:

- **Magnitude.** Aid must be large enough to enable the recipient country to finance its investment plan.
- **Timing.** Aid must be long term enough to enable the recipient country to follow through on a ten-year program of scaling up.
- **Predictability.** Aid must be predictable enough so that stops and starts in the aid flows do not jeopardize the investment program or the macroeconomic stability of the recipient country.
- **Harmonization.** Aid must support the MDG-based poverty reduction strategy, and specifically the investment plan, rather than the pet projects of the aid agencies.

Let me underscore why predictability of aid will be almost as important as the overall amount of aid. If poverty is to be ended, aid of around $60 per person per year will have to flow to the poorest countries. But that level of aid will constitute around 20 to 30 percent of GDP when per capita incomes are in the range of $200 to $300 per person per year. When aid flows are such a large part of GDP, unexpected fluctuations in aid can be a huge shock to the economy. If, one year, the donors give 30 percent of GDP, but the next year only 15 percent of GDP, the result would be massive layoffs, closures of government facilities, huge budget deficits, and inflation. To guard against this threat, donor aid must be highly predictable over a period of at least a few years.

The issue of aid harmonization is also crucial. A discussion in 2000 about aid to Tanzania noted that there are “thirty agencies involved in providing development funds, 1,000 projects, 2,500 aid missions a year [and all with separate accounting, financial and reporting systems....” World Bank President at the time Jim Wolfensohn commented, “I think that we are now in a situation where everybody recognizes that to have countries burdened with innumerable visits from good-hearted people like us and all the bilateral donors, and innumerable reports that they have to complete quarterly and little coordination in terms of some of the mechanics of the implementation, that there is a large pick-up to be had in just coordinating and better implementing what the development community are doing already.”

In order to harmonize aid, the various aid agencies should operate on the basis of their true comparative advantage. When it comes to large-scale aid to help countries expand their public investment programs, the money should flow through multilateral donors such as the World Bank and the regional development banks. Why should Ghana negotiate with twenty-three bilateral donors when what Ghana really needs is budget support to scale up public investments? The twenty-three bilateral donors should agree, beforehand, to pool their money at the World Bank or the African Development Bank, and then let those institutions make a single grant. The bilateral agencies are much better when it comes to matters that require individual small-scale projects, such as specific kinds of technical assistance (for example, to treat AIDS patients or to mobilize solar power), or small-scale experiments, or people-to-people exchanges.
A Public Management Strategy

Financing is necessary, but hardly sufficient, for success. Money will be wasted or sit idly in a bank account if the government is unable to implement its investment plan. Implementation requires time, of course, for planning, construction, training, and improved oversight. But beyond the necessary time, a sound public management plan should have six components:

- **Decentralization.** Investments are needed in hundreds of thousands of villages and thousands of cities. The details will have to be decided at the ground level, in the villages and cities themselves, rather than in the capitals or in Washington. Decentralized management of public investment is therefore a sine qua non of scaling up.

- **Training.** The public sector at all levels-national, district, village—lacks the talent to oversee the scaling-up process. This is not a case for evading the public sector, which will not work, but for building the capacity of the public sector. Training programs (or capacity building) should be part of the overall strategy.

- **Information Technologies.** If the aid plumbing is going to carry much larger flows of aid each year, we will need better meters, which will mean the use of information technologies—computers, e-mail, mobile phones—to increase dramatically the amount of information transmitted in the public sector and accessible to all parties.

- **Measurable Benchmarks.** Much clearer targets of what is to be achieved must accompany a major increase of spending. Every MDG-based poverty reduction strategy should be supported by quantitative benchmarks tailored to national conditions, needs, and data availability.

- **Audits.** Let's face it: the money has to reach the intended recipients. No country should receive greater funding unless the money can be audited.

- **Monitoring and Evaluation.** Right from the start, the MDG-based poverty reduction strategy should prepare to have the investments monitored and evaluated. Budgets and mechanisms for monitoring and evaluation should be essential parts of the strategies.

Regional Infrastructure

Many important investments are regional in nature and involve several countries at once. Consider, as I did earlier, the road that links the Kenyan port of Mombasa with the four countries that depend on that port: Kenya, Uganda, Rwanda, and Burundi. The road is a two-lane, semipaved road that services more than a hundred million people. It is poorly maintained and imposes extremely high costs for freight shipments to and from the coast. One part or another of the road frequently gives way. The road should be repaired in a shared four-country project, rather than as piecemeal haphazard projects within each of the four countries. The problem is that the World Bank and other donors are not good at managing multicity projects, since they are used to thinking about one country at a time. Various regional economic groups have sprung up around the world, including several in Africa, that could help to achieve coordination of investments across neighboring countries. Multicountry investments will become more common, not only in roads and rail, but also in port services, telecommunications, financial market regulations, biodiversity conservation (of forests and river sheds), control of air and water pollution, energy development (including hydropower, geothermal power, electricity transmission), and other areas.

Regional groupings can also play another significant role: shared responsibility for governance. Countries respond to peer pressure. The African Union is utilizing that basic insight to launch a policy known as the African Peer Review Mechanism (APRM), in which countries voluntarily subscribe to a systematic governance review by their peers. As the African Union describes it, the primary purpose of the APRM is to foster the adoption of policies, standards and practices that lead to political stability, high economic growth, sustainable development and accelerated sub-regional and continental economic integration through sharing of experiences and reinforcement of successful and best practice, including identifying deficiencies and assessing the needs of capacity building.
The experience of many other regional efforts, from the Marshall Plan to the European Union, shows that these hopes have great merit. Group pressure from outside can help to keep a reform-minded government on track, just as Poland's hopes to join the European Union helped to insulate Poland's economic reform policies from enormous and inappropriate short-term pressures and populist enticements.

**Global Policies for Poverty Reduction**

Poor countries also have critical needs that cannot be solved by national or regional investments or by domestic policy reforms. There are concerns that must be addressed at the global level. Four are most important:

- The Debt Crisis
- Global Trade Policy
- Science for Development
- Environmental Stewardship

**The Debt Crisis**

This issue should have been resolved years ago. For at least twenty years we have known that heavily indebted poor countries (HIPC's) are unable to repay their debts, or at least do so and achieve the MDGs at the same time. The debts should simply have been canceled, but the debtors have insisted for far too long that the poorest countries of the world continue to pay debt service, often in amounts that were greater than national spending on health and education. In fact, rich countries should have given the poorest countries grants rather than loans, so that the poor countries would never have been indebted in the first place.

The behavior of the creditor countries in recent decades compares very poorly with the U.S. commitment and practice during the formulation of the Marshall Plan, when it decided to help rebuild Europe with grants rather than loans. The post–World War II planners knew well the disastrous experience after World War I, when, as Keynes had foretold, allied war debts and post–World War I reparations claims entangled creditor and debtor nations in a prolonged political and financial crisis that contributed to the Great Depression and indirectly to the rise of fascism. After World War II, U.S. strategists chose a different course, ensuring that postwar debts would not encumber Europe's fragile democracies. We would do well to emulate that wisdom today. It is time for the debts of the highly indebted poor countries to be cancelled outright as part of the financing package for the Millennium Goals-based poverty reduction strategies.

**Global Trade Policy**

Sustained economic growth requires that poor countries increase their exports to the rich countries, and thereby earn the foreign exchange to import capital goods from the rich countries. Yet trade barriers in rich countries hamper export growth. The ongoing Doha Trade Round, launched in November 2001, is committed—on paper at least—to improving market access for poor countries. This commitment is vitally important, especially in low-skill, labor-intensive sectors such as garment manufacture. Still, two caveats are in order.

The first is that although trade is important, the popular slogan "trade not aid" is wrong. Poor countries will need "trade plus aid," since trade reforms alone are not nearly powerful enough to enable the poorest countries to escape from extreme poverty. The "trade not aid" lobby seeks to use the undoubted importance of open trade to undermine the case for aid. Even if trade reforms would raise the incomes of the poorest countries by billions of dollars per year, only a small fraction of that would be available for funding the vitally important public investments needed to escape from the poverty trap. When huge gains are attributed to trade reforms (hundreds of billions of dollars), we need to look at the fine print: almost all of those gains accrue to the richest countries and the middle-income countries, not the poorest countries, and especially not the poorest countries in Africa. How, after all, could trade alone enable isolated rural villages in Africa to meet their basic needs?

The second caveat is to warn against hyperbole vis-à-vis agricultural trade liberalization. There is no doubt that liberalization of world agricultural trade would be a good thing. Europe, for example, wastes incredible amounts of money subsidizing its high-cost farmers, and could accomplish other goals (environmental preservation) much more cheaply. But it is wrong to conclude that the end of agricultural subsi-
dies would be a great boon for least developed countries in Africa and other parts of the world. If Europe cuts back on its subsidies for staple crops (wheat, maize), the results for Africa could well be negative, not positive, since Africa is a net food-importing region: consumers of food would pay higher prices for food, whereas farmers would benefit. The net effects on poverty could be either positive or negative, but are very unlikely to be hugely beneficial. Africa will unambiguously benefit from the liberalization of trade in tropical products (for example, cotton, sugar, bananas), but the subsidies for tropical products are only a very small part of the widely reported $300 billion in artificial support for farmers in the rich countries. In short, liberalize trade in agriculture, but do not believe it to be a panacea. The benefits will accrue overwhelmingly to the large food exporters: the United States, Canada, Argentina, Brazil, and Australia.

Science for Development

Many of the core breakthroughs in long-term economic development have been new technologies: the Green Revolution for food production, vaccines and immunizations, antimalarial bed nets, oral rehydration therapies, agroforestry to replenish soil nutrients, antiretroviral medicines. In almost all of these cases, the technologies were first developed for the rich-country markets, or were sponsored for the poor nations in a special donor-led process. It is very rare, alas, that technologies are developed by the private sector to meet specific challenges in the poor countries (for example, for tropical foods or diseases). The poorest of the poor simply do not provide enough of a market incentive for private-sector-led research and development.

Recognizing that the poor are therefore likely to be ignored by the international scientific community—unless special efforts are made—it is critical to identify the priority needs for scientific research in relation to the poor, and then to mobilize the requisite donor assistance to spur the research and development. Here are a few areas of special importance, drawing on work by various scientific bodies in recent years that have explored this issue:

- Diseases of the poor: new preventive, diagnostic, and therapeutic measures for diseases specific to low-income countries, especially tropical diseases
- Tropical agriculture: new seed varieties, water management techniques, and soil management techniques
- Energy systems in remote rural areas: special technologies for off-grid power, including renewable energy sources (for example, photovoltaic cells), power generators, improved batteries, and low-watt illumination
- Climate forecasting and adjustment: improved measurement of seasonal, interannual, and long-term climate changes, with a view toward prediction as well as adjustment to climate changes
- Water management: improved technologies for water harvesting, desalination, small-scale irrigation, and improved management of aquifers being depleted by overuse. Water will rise in importance as population densities and climate change interact to produce more regions in acute water stress.
- Sustainable management of ecosystems: fragile ecosystems around the world (coral reefs, mangrove swamps, fisheries, rainforests, to name a few) are succumbing to anthropogenic forces, often with dire consequences. In many cases, poor communities do not have the technical capacity to monitor changes or to respond in an effective and sustainable manner.

The UN Millennium Project recommends global donor support on the order of $7 billion per year to address priority R&D needs for health, agriculture, energy, climate, water, and biodiversity conservation in the poorest countries. Targeted scientific efforts have had huge benefits in the past. The Rockefeller Foundation financed the research leading to the yellow fever vaccine in 1928 and much of the plant breeding research leading to the Green Revolution. In recent years the Bill and Melinda Gates Foundation has financed extensive research into AIDS, TB, malaria, and other diseases that afflict the poor. GlaxoSmithKline, working together with the Gates Foundation, has recently announced promising advances toward a malaria vaccine, though a proven vaccine for use in Africa is still years off. In order to stimulate the needed research and clinical testing of new vaccine candidates, I have recommended together with Harvard economist Michael Kremer that donor agencies and the Global Fund to Fight AIDS, TB, and Malaria commit ahead of time to purchasing a successful vaccine on a large scale for dis-
tribution in Africa, thereby creating a financial incentive for vaccine research and development.

Environmental Stewardship

Even though the local effects of global climate change are extremely hard to forecast, we can be sure that many of the world’s poorest places are at risk of being overwhelmed by climate shocks coming from outside their borders. Rising ocean levels associated with long-term warming will likely inundate impoverished regions such as Bangladesh and small island economies. Shifting patterns of rainfall, such as the declines in precipitation evident in Africa’s Sahel and those associated with long-term warming in the Indian Ocean, are likely to be experienced elsewhere. An increasing frequency and intensity of El Niño climate cycles could become an important disturbance for hundreds of millions of people in Asia, Latin America, and Africa. Changes in ocean chemistry associated with rising atmospheric concentrations of carbon dioxide could poison the coral reefs, with attendant disastrous effects on coastal ecosystems and coastal economies.

The poorest of the poor are mostly innocent victims in this drama. The major cause of long-term climate change, fossil fuel combustion, is disproportionately the result of rich-country actions. Any responsible global approach to poverty reduction should include much greater attention to three things. First, the rich countries themselves, and particularly the United States, will have to live up to their longstanding commitment under the United Nations Framework Convention on Climate Change to the “stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.” Second, the rich countries will have to give added financial assistance to the poor countries to enable them to respond effectively to, or at least to cope with, the changes ahead. Third, as I noted earlier, the rich countries will have to invest more in climate science to gain a clearer understanding of how the changes already under way are likely to affect the world’s poorest people, as well as the rest of us.

The poor countries refer euphemistically to the UN agencies, bilateral donors, and Bretton Woods institutions as their “development partners.” In the best of circumstances, these agencies and counterpart governments really act as partners. Often, however, they can be as much nuisance as help. Aid flows are often small and unpredictable, while hundreds of small-scale aid projects eat up the time and attention of overstretched and impoverished governments. Harmonization of aid in support of a single MDG-based poverty reduction strategy is vital.

In order to harmonize aid, however, the partners themselves need to do a better job in dealing with each other. The key, I believe, is to use the United Nations system to its best advantage. The UN secretary-general is the best placed official in the world to help coordinate the various stakeholders who must contribute to the achievement of the Millennium Development Goals. The UN agencies offer vitally important expertise in every aspect of development. A partial listing of these agencies and their core areas of competence is shown in table 1. With the lead of the secretary-general, each low-income country should have the benefit of an effective United Nations Country Team (UNCT). The UNCT includes all of the UN specialized agencies that operate in the country, and usually the IMF and World Bank as well. In each country, the work of these agencies should be harmonized through the efforts of the United Nations resident coordinator, who reports to the administrator of the United Nations Development Program, who in turn reports to the UN secretary-general. This UN country team is vital to providing every poor country with the best of international evidence and science addressed to the challenges of escaping the poverty trap and achieving sustainable development.

Why do I belabor such an obvious housekeeping point? Because the current system is surprisingly dysfunctional, to the point where the IMF and the World Bank sometimes hardly speak with the UN agencies, even though they all depend on one another. For the past twenty years, the rich countries have assigned the IMF and the World Bank a privileged position in relation to the other UN agencies, so much so that the other agencies would sometimes have to call me simply to find out what the IMF was actually doing in a particular country. They lacked the direct access to find out on their own.
Why the IMF and the World Bank were given this privileged position is easily explained. As the old advice puts it, Follow the money. The rich countries hold sway in the IMF and the World Bank much more than in the UN agencies. Unlike the UN General Assembly, and most of the boards of the specialized agencies, where it's "one country, one vote," in the IMF and the World Bank, it's "one dollar, one vote." Each member of the IMF and the World Bank joins with an assigned quota, which determines the voting rights of the country and the size of the country's subscription. In this way, the rich countries have kept a voting majority. This voting majority has led the United States, in particular, to rely more heavily on the IMF and the World Bank, which it more easily controls, than on the UN agencies, over which it has much less influence.

The problem is that the IMF and the World Bank simply cannot do their jobs without much closer cooperation with the UN agencies. The IMF and the World Bank are generalist institutions, the IMF for macroeconomic (budget, financial, exchange rate) issues and the World Bank for development issues. The UN agencies are specialized institutions. UNICEF, for example, has great knowledge in child health and education; the United Nations Population Fund (UNFPA) has unrivaled expertise in family planning; the Food and Agriculture Organization (FAO) is unmatched in agriculture; the World Health Organization (WHO) has unique capacity in public health and disease control; the United Nations Development Program (UNDP) is unequaled in capacity building and governance; and so on. On the other hand, the specialized agencies rarely have the macroeconomic overview that is an important part of the IMF–World Bank perspective. Without a much closer partnership of the specialized UN agencies with the IMF and the World Bank, none of these institutions can do their work properly.

### Table 1: UN Agencies in Development (partial list)

<table>
<thead>
<tr>
<th>Agency</th>
<th>Abbreviation</th>
<th>Core Areas of Concern in Developing Countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bretton Woods Institutions</td>
<td></td>
<td>Provides assistance to developing countries on finance and budgetary issues, and temporary financial assistance to help ease macroeconomic adjustments</td>
</tr>
<tr>
<td>International Monetary Fund</td>
<td>IMF</td>
<td>Provides loans and grants, policy advice, and technical assistance to help low- and middle-income countries fight poverty</td>
</tr>
<tr>
<td>World Bank</td>
<td></td>
<td>Provides loans and grants, policy advice, and technical assistance to help low- and middle-income countries fight poverty</td>
</tr>
<tr>
<td>Food and Agriculture Organization</td>
<td>FAO</td>
<td>Leads fight on hunger, providing policy advice and technical assistance</td>
</tr>
<tr>
<td>International Fund for Agricultural Development</td>
<td>IFAD</td>
<td>Finances agricultural development projects to increase food production and improve nutrition</td>
</tr>
<tr>
<td>United Nations Development Program</td>
<td>UNDP</td>
<td>Serves as the UN's global development network; also has programs to strengthen democratic governance in developing countries, fight poverty, improve health and education, protect the environment, and deal with crises</td>
</tr>
<tr>
<td>United Nations Environment Program</td>
<td>UNEP</td>
<td>Helps countries care for the environment through projects and technical scientific support</td>
</tr>
<tr>
<td>United Nations Human Settlements Program</td>
<td>HABITAT</td>
<td>Promotes socially and environmentally sustainable towns and cities with the goal of providing adequate shelter for all</td>
</tr>
<tr>
<td>United Nations Population Fund</td>
<td>UNFPA</td>
<td>Helps countries establish population and reproductive health programs</td>
</tr>
<tr>
<td>United Nations Children's Fund</td>
<td>UNICEF</td>
<td>Improves children's lives, particularly through programs promoting education, health, and child protection</td>
</tr>
<tr>
<td>World Food Program</td>
<td>WFP</td>
<td>Frontline agency in the fight against global hunger, feeding over 100 million people in 81 countries in 2003, including most of the world's refugees and internally displaced people.</td>
</tr>
<tr>
<td>World Health Organization</td>
<td>WHO</td>
<td>Provides vital technical assistance to countries on investing in health</td>
</tr>
</tbody>
</table>

**NEXT STEPS**

Extreme poverty is a trap that can be released through targeted investments if the needed investments are tested and proved and the investment program can be implemented as part of a global compact between rich and poor countries, centered on a Millennium Development Goals-based poverty reduction strategy. That is all great news. But can we afford to do all of this? Would helping the poor in fact bankrupt the rich? I answer this underlying question, in some detail, in the next chapter.
It may seem highly imprudent to ask the rich world to take responsibility for helping the poorest of the poor to escape from the poverty trap. Not only is the task thankless and endless, it may also break the bank—or so the thinking goes. After all, haven’t the rich world’s own welfare programs proven to be too much to handle? Aren’t the rich countries in enough of a fiscal mess with the problems that they have already taken on? How could the rich world possibly take responsibility for billions of people outside of their borders, in countries with rapidly growing populations? These are all reasonable questions. Happily, they have reasonable answers. The more one looks at it, the more one sees that the question isn’t whether the rich can afford to help the poor, but whether they can afford not to.

The truth is that the cost now is likely to be small compared to any relevant measure—income, taxes, the costs of further delay, and the benefits from acting. Most important, the task can be achieved within the limits that the rich world has already committed: 0.7 percent of the gross national product of the high-income world, a mere 7 cents out of every $10 in income. All of the incessant debate about development assistance, and whether the rich are doing enough to help the poor, actually concerns less than 1 percent of rich-world income. The effort required of the rich is indeed so slight that to do less is to announce brazenly to a large part of the world, “You count for nothing.” We should not be surprised, then, if in later years the rich reap the whirlwind of that heartless response.

There are five reasons why the level of required effort is, in truth, so modest. First, the numbers of extreme poor have declined to a relatively small proportion of the world’s population. The World Bank estimates that some 1.1 billion people live in extreme poverty today, a bit less than one fifth of the world’s population. A generation ago, the proportion was roughly one third. Two generations ago, the proportion was closer to one half. The proportion of the world’s population still mired in extreme poverty is, relatively speaking, manageable.

Second, the goal is to end extreme poverty, not to end all poverty, and still less to equalize world incomes or to close the gap between the rich and the poor. This may eventually happen, but if so, the poor will have to get rich on their own effort. The rich can help most by giving the extreme poor some assistance to extricate themselves from the poverty trap that now ensnares them.

Third, success in ending the poverty trap will be much easier than it appears. For too long, too much economic thinking has been directed at the wrong question—how to make the poor countries into textbook models of good governance or efficient market economies. Too little has been done to identify the specific, proven low-cost interventions that can make a difference in living standards and economic growth. When we get practical, and speak of investments in specific areas—roads, power, transport, soils, water and sanitation, disease control—the task is suddenly a lot less daunting.

Fourth, the rich world today is so vastly rich. An effort to end extreme poverty that would have seemed out of reach even a generation or two ago is now well within reach because the costs are now such a small fraction of the vastly expanded income of the rich world. Especially for the United States, part of the solution to getting donors to honor their commitment to the world’s extreme poor is to assign more responsibility to the richest of the rich, not the average taxpayers, but taxpayers with incomes at the very top of the charts. The rich can manage to pay for a significant proportion of what needs to be done, either through a modest increase in taxation or a burst of large-scale philanthropy commensurate with their vast wealth.

Fifth, our tools are more powerful than ever. Mobile phones and the Internet are ending the information famine of rural areas in Asia and Africa. Improved logistics systems now enable global industries to operate profitably in far-flung regions. Modern agronomic practices, including improved seed breeding, agrobiotechnology, and science-based
management of soil nutrients, are restoring lands that were long degraded or opening new lands that were previously considered infertile. New approaches to disease prevention and control offer the prospect of breakthroughs in medical practice. It is true that these investments still reach only a small fraction of the poorest of the poor. At the core of poverty reduction lies the strategy of scaling up critical investments in infrastructure, health, and education, investments that have been rendered vastly more effective through rapid technological progress.

Here are some calculations of what it will cost to get the job done, and who should pay.

THE SIMPLEST CALCULATION

The first cut at the problem—the simplest but still eye-opening—is to ask how much income would have to be transferred from rich countries to poor countries to lift all of the world’s extreme poor to an income level sufficient to meet basic needs. Martin Ravallion and his colleagues on the World Bank’s poverty team have gathered data to address this question, at least approximately. The World Bank estimates that meeting basic needs requires $1.08 per day per person, measured in 1993 purchasing-power adjusted prices. Using household surveys, the Ravallion team has calculated the numbers of poor people around the world who live below that threshold, and the average incomes of those poor.

According to the Bank’s estimates, 1.1 billion people lived below the $1.08 level as of 2001, with an average income of $0.77 per day, or $281 per year. More important, the poor had a shortfall relative to basic needs of $0.31 per day ($1.08 minus $0.77), or $113 per year. Worldwide, the total income shortfall of the poor in 2001 was therefore $113 per year per person multiplied by 1.1 billion people, or $124 billion.

Using the same accounting units (1993 purchasing power adjusted U.S. dollars), the income of the twenty-two donor countries of the Development Assistance Committee (DAC) in 2001 was $20.2 trillion. Thus a transfer of 0.6 percent of donor income, amounting to $124 billion, would in theory raise all 1.1 billion of the world’s extreme poor to the basic-needs level. Notably, this transfer could be accomplished within the 0.7 percent of the GNP target of the donor countries. That transfer would not have been possible in 1980, when the numbers of the extreme poor were larger (1.5 billion) and the incomes of the rich countries considerably smaller. Back in 1981, the total income gap was around $208 billion (again, measured in 1993 purchasing power prices) and the combined donor country GNP was $13.2 trillion. Then it would have required 1.6 percent of donor income in transfers to raise the extreme poor to the basic-needs level.

THE NEEDS ASSESSMENT APPROACH

Except for humanitarian emergencies, direct cash transfers are rarely an attractive way to deliver official development assistance (ODA). Cash transfers can raise the poor above desperate income levels, but are not likely to unlock the poverty trap if they merely fill a consumption gap. To end the poverty trap, as I have explained, direct foreign assistance should be used for investments in infrastructure and human capital (through public services in health, nutrition, and education), thereby empowering the poor to be more productive on their own account, and putting the poor countries on a path of self-sustaining growth.

To estimate the costs of the investments needed to end extreme poverty, a straightforward approach with six specific steps has proven extremely useful for the WHO Commission on Macroeconomics and Health and for the UN Millennium Project. The key is to identify a core package of public infrastructure and social investments to meet basic needs and to end the poverty trap. These investments include roads, power, water and sanitation, health care, education, and the like.

This approach to costing these investments has the following six steps:

- Identify the package of basic needs
- Identify, for each country, the current unmet needs of the population
- Calculate the costs of meeting the unmet needs through investments, taking into account future population growth
- Calculate the part of the investments that can be financed by the country itself
- Calculate the Millennium Development Goals Financing Gap that must be covered by donors
• Assess the size of the donor contributions relative to donor income

These calculations will show the worldwide cost of ending extreme poverty. They are not meant to suggest that money in such amounts should automatically be levied on the rich and turned over to the poor. As I have stressed repeatedly, the actual transfer of funds must be based on rigorous, country-specific plans that are developed through open and consultative processes, backed by good governance in the recipient countries, as well as careful monitoring and evaluation. For these reasons, the actual flow of resources could, alas, be much smaller than the needs assessment will show. If areas of extreme poverty remain, it would not be because of a lack of donor will, but a lack of recipient-country ability to use donor support effectively.

THE PACKAGE OF BASIC NEEDS

The WHO Commission on Macroeconomics and Health identified 49 essential health services that constitute the basic package of health interventions. The UN Millennium Project expanded that list of health interventions and complemented it with interventions in other critical areas—food production and nutrition, education, infrastructure—to enumerate some 150 interventions or public services that should be universally accessible. The standards of need are minimum standards, consistent with the interpretation that lack of access to these interventions constitutes extreme poverty. These interventions include, for example:

• Primary education for all children, with designated target ratios of pupils to teachers
• Nutrition programs for all vulnerable populations
• Universal access to antimalarial bed nets for all households in regions of malaria transmission
• Access to safe drinking water and sanitation
• One-half kilometer of paved road for every thousand of population
• Access to modern cooking fuels and improved cooking stoves to decrease indoor air pollution

In the high-income countries, these and other needs are already 100 percent fulfilled, even for the relatively poor in those societies. This underscores the point that extreme poverty (a lack of access to basic needs) is very different from the relative poverty (occupying a place at the bottom of the income distribution) within the rich countries. In the middle-income countries, these interventions are also generally available for most, if not all, of the population.

To meet these needs for an entire population requires a decade or more of investments in physical and human capital. The next step of the analysis is to estimate the proportion of the population in each country that lacks access to the relevant service, and to propose an investment profile that closes the gap within a specific period of time. The UN Millennium Project calculated an investment profile to the year 2015 of sufficient scope to achieve the Millennium Development Goals. Of course, such calculations require intensive country-specific knowledge that can only be carried out with a high degree of accuracy within each country itself, but for the UN Millennium Project, and our purposes here, we can make some rough approximations.

For five developing countries—Bangladesh, Cambodia, Ghana, Tanzania, and Uganda—the UN Millennium Project calculated the costs of scaling up infrastructure and social services by the year 2015 to have a price tag of roughly $100 per person per year during the period 2005 to 2015. (All prices in the UN study were expressed in constant 2000 U.S. dollars). Since cost data were unavailable for some critical interventions,* the true needs are likely to be at least $110 or higher. For the rich world, with its annual income of some $27,000 per person per year, and government revenues of $7,000 per person per year or more, $110 is a very small sum. For the poorest countries, however, $110 per capita is a very large sum, equal to the income per capita of Ethiopia in 2001, and one third of the average income per capita of these five developing countries. Most of the services, moreover, are to be provided by

*The interventions that have not yet been quantified include: higher education; storage and distribution infrastructure for water and fuel; irrigation systems; ports and railroads; information and communication technologies; and specific investments in environmental sustainability.
government. But government revenues in low-income countries are generally around 10 percent of national income. For a country at $300 per capita, therefore, domestic revenues for the national budget might total around $30 per capita, less than one third of the cost of providing the basic package of infrastructure and social services.

Once the cost of the basic package is identified, the next step is to figure out who can pay for what. To at least a small extent, households themselves can pay out of household income for some of their basic needs, for example, through purchases from private-sector providers. The government can provide a larger fraction out of domestic public revenues. The rest constitutes the "financing gap" that international donors would have to pay. To allocate these proportions of the $110 per year, the UN Millennium Project made the following assumptions. First, it assumed that domestic government revenues directed at poverty reduction could be raised substantially as a share of GDP, specifically by 4 percentage points as of the year 2015. Second, it assumed that for certain sectors—such as health and education—the basic package would be paid entirely by the public sector (using domestic revenues or donor aid) rather than by households. Third, it assumed that households could pay for part of their energy consumption, water supply, sanitation services, and investments in agricultural productivity, but with payments graduated according to household income: the households in extreme poverty would receive the services with full subsidy, the next richer group would pay a part of the cost, and the high-income households would cover their full costs.

**Sharing the Investment Costs**

Using this approach, the UN Millennium Project identified the total costs of meeting the goals and the allocation of those costs among the national government, the households (paying out of pocket), and the donors. The costs differ by region for two reasons. First, the needs differ. Second, the costs of meeting those needs differ. In general, a given package of investments is slightly cheaper to implement in poor countries because the costs of labor are lower.

With these assumptions, the findings for the five developing countries were the following: Of the $110 per person per year, households will be able to pay around $10 per person per year, whereas the government could be expected to cover another $35 per person per year out of budget revenues. The remainder, roughly $65 per person per year, constitutes the financing gap, which donors will have to finance.

When the same calculation is made for middle-income countries, the situation is completely changed. Countries such as Brazil, Chile, or Mexico are able to provide the complete package of services out of domestic resources. They do not need donor assistance to end extreme poverty, since they have sufficient domestic resources to accomplish the task. Of course, they may still have many extremely poor citizens, but according to this analysis, that is mainly because of the lack of internal efforts. China, too, is largely able to cover its needs. India is just straddling the divide, requiring a significant amount of help—roughly $4 to $5 per person per year—but it is an amount that will decline over time as India’s rapid economic growth continues.

As a general matter, the middle-income countries are able to cover their own needs, whereas the low-income countries generally will require at least some modest assistance from abroad to meet basic needs by 2015. Although a precise costing on a global scale really requires a detailed country-by-country assessment, some rough extrapolations from a small number of detailed country estimates allow us to approximate the global donor effort required. A rough guess puts the donor needs until 2015 at around $40 billion for sub-Saharan Africa, and perhaps twice that, or $80 billion for the entire developing world. This estimate corresponds with an even simpler route to the number. With roughly 1.1 billion people in extreme poverty, and each requiring roughly $65 per capita in annual assistance, the donor price tag would be around $72 billion per year until 2015, in addition to costs for global initiatives such as vaccine development and for managing the large increase in assistance. The actual outlay of funds, to repeat, is likely to be lower since it would cover only those countries with sufficiently good planning and governance to justify the aid.

Table 1 shows the regional breakdown of the donor assistance to finance the investments needed to meet the Millennium Development Goals. This table makes clear that Africa and Asia remain the two epicenters of extreme poverty and the two regions where large-scale donor aid is still most urgently needed. Of course, individual countries in other regions are also found to require donor aid, so a calculation of this kind needs to be made on a country-by-country basis.
Table 1: Regional Breakdown of Annual Budget Support Required from Donors to Meet the MDGs

<table>
<thead>
<tr>
<th>Region</th>
<th>2006</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>East Asia and Pacific</td>
<td>11.1</td>
<td>8.9</td>
</tr>
<tr>
<td>Europe and Central Asia</td>
<td>2.9</td>
<td>2.9</td>
</tr>
<tr>
<td>Latin America and Caribbean</td>
<td>0.7</td>
<td>1.3</td>
</tr>
<tr>
<td>Middle East and North Africa</td>
<td>0.9</td>
<td>1.4</td>
</tr>
<tr>
<td>South Asia</td>
<td>22.4</td>
<td>36.8</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td>36.4</td>
<td>83.4</td>
</tr>
<tr>
<td>Total</td>
<td>73.5</td>
<td>134.7</td>
</tr>
</tbody>
</table>

Source: UN Millennium Project (2005).

The sector breakdown of the external finance needed for the investment program is shown in table 2, taking the case of three sub-Saharan African countries for these detailed calculations. The table helps to clarify where the foreign assistance should be directed: some 35 percent of total assistance should go to the health sector, 35 percent to energy and road infrastructure, another 15 percent to education, 2 percent to water and sanitation; and the rest to other components of the core package.

### How Much Total Official Development Assistance is Needed?

Even if we know that around $70 to $80 billion per year would be needed within poor countries by 2006, it is still tricky to determine the total amount of development assistance that the rich world should provide to the poor for three reasons. First, a considerable proportion of official donor assistance is not for development at all, but for other purposes such as emergency relief, care and resettlement of refugees, geopolitical support of particular governments, and help for middle-income countries that have already largely ended extreme poverty. Second, of the portion of foreign aid directed to development, only a fraction of that aid currently comes in a form that can help to finance the intervention package. Much of the aid, for example, is technical assistance, which is not counted in the Millennium Project’s cost estimates. Some aid is for cancellation of debts that were not being paid...
anyway. While debt cancellation may be very important for enabling a country to regain access to credit markets, or to regain hope, it does not add to actual resource flows if the debts could not be serviced anyway. Third, there is need for direct assistance to support investments at the global level that are above and beyond the financial needs of specific poor countries.

To clarify the first reason, consider the following breakdown of current official development assistance: total gross foreign aid from all donors to all developing countries in 2002 was $76 billion (all numbers in 2003 dollars). Of that, $6 billion were debt relief grants, which do not correspond to any actual flow of resources. Moreover, developing countries paid close to $11 billion in loan repayments to rich countries, leaving a net flow of foreign aid of $59 billion. Of that amount, $16 billion went to middle-income countries. Of the $43 billion that went to low-income countries, $12 billion at the most were devoted to direct support of the government. The remainder consisted mostly of emergency assistance and technical cooperation, which mostly pays for expensive foreign consultants rather than local experts.

Roughly speaking, only $12 billion out of the $43 billion went to low-income countries in a form that could be deemed budgetary support, and thus helped support the package of basic needs interventions. For all developing countries, only around $15 billion of the $48 billion in net ODA flows in 2002 could be considered to be the kind of support for financing investments in basic needs. The remaining $33 billion reflects other considerations and costs that are not available for making the investments I have been discussing. Some go to emergency relief and technical cooperation that funds in parts the building of capacity. Other important needs are regional infrastructure and global research, which currently receive roughly $4 billion. Finally, the operating and other cost of bilateral and multilateral agencies account for $9 billion.

In addition to the $73 billion (rising to $135 billion per year in 2015) for the scaling up of basic needs at the country level, $48 to $54 billion will be required each year to finance other needs. These include the costs of running the aid agencies themselves, in essence, the costs for operating an international system of donor assistance. The UN Millennium Project estimated an additional $2 to $5 billion per year in such costs to increase technical assistance capacity of international and donor organizations plus an additional $1 to $3 billion in increased costs to bilateral donors. The added expenses reflect the increased operational responsibilities of the specialized UN agencies, the IMF and World Bank, the regional development banks, and the bilateral donors. There are also the costs of greater investments in global science directed at the needs of the poor, on the order of an estimated $7 billion per year by 2015.

If we put the pieces together and make further adjustments for poorly governed countries that won’t qualify for aid and for rechanneling some existing aid, total global foreign aid would amount to something like what is shown in table 3. Net ODA flows in 2006 came to $135 billion per year (up from $65 billion) and increase gradually to $195 billion by 2015. Clearly, there is not a high degree of precision in these estimates. The exact costs of meeting the Millennium Development Goals cannot be determined until each country conducts its own detailed costing following the Millennium Project methodology. Still, the estimates show one compelling fact. The bottom line of about $135 to $195 billion per year for the period 2005 to 2015 is about 44 to 54 percent of the rich-world GNP each year during the forthcoming decade, significantly less than the 0.7 percent of GNP promised in ODA, which would be closer to an average of $235 billion per year (in constant 2003 dollars). The point is that the Millennium Development Goals can be financed within the bounds of the official development assistance that the donor countries have already promised.
### Table 3: Estimated Cost of Meeting the MDGs in Every Country

<table>
<thead>
<tr>
<th></th>
<th>2002</th>
<th>2006</th>
<th>2010</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>I. MDG Investment Needs in Low-Income Countries</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• MDG Financing Gap</td>
<td>12</td>
<td>75</td>
<td>89</td>
<td>135</td>
</tr>
<tr>
<td>• Capacity Building to Achieve the MDGs</td>
<td>5</td>
<td>7</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>• Grants in Support of Heavy Debt Burden</td>
<td>-</td>
<td>7</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>• Debt Relief to Poor Countries</td>
<td>4</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Minus: Repayments of Concessional Loans</td>
<td>-5</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Subtotal</td>
<td>15</td>
<td>94</td>
<td>108</td>
<td>149</td>
</tr>
<tr>
<td><strong>II. MDG Investment Needs in Middle-Income Countries</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• ODA Provided Directly to Government</td>
<td>4</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>• Capacity Building to Achieve the MDGs</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Minus: Repayments of Concessional Loans</td>
<td>-6</td>
<td>-5</td>
<td>-4</td>
<td>-6</td>
</tr>
<tr>
<td>Subtotal</td>
<td>3</td>
<td>12</td>
<td>11</td>
<td>9</td>
</tr>
<tr>
<td><strong>III. MDG Investment Needs at the International Level</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Regional Cooperation and Infrastructure</td>
<td>2</td>
<td>3</td>
<td>7</td>
<td>11</td>
</tr>
<tr>
<td>• Funding for Global Research</td>
<td>1</td>
<td>5</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>• Implementing the Rio Conventions</td>
<td>1</td>
<td>2</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>• Technical Cooperation by International Organizations</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>Subtotal</td>
<td>10</td>
<td>15</td>
<td>23</td>
<td>31</td>
</tr>
</tbody>
</table>

**Estimated Cost of Meeting the MDGs in Every Country**

<table>
<thead>
<tr>
<th></th>
<th>2002</th>
<th>2006</th>
<th>2010</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Plausible ODA Needs to Meet the MDGs</strong> (in billions of 2003 US$)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline ODA for the MDGs in 2002</td>
<td>27</td>
<td>27</td>
<td>27</td>
<td>27</td>
</tr>
<tr>
<td>+ Incremental MDG Investment Needs</td>
<td>94</td>
<td>115</td>
<td>161</td>
<td></td>
</tr>
<tr>
<td>- Adjustment for Nonqualifying Countries Due to Inadequate Governance</td>
<td>-21</td>
<td>-23</td>
<td>-25</td>
<td></td>
</tr>
<tr>
<td>- Reprogramming of Existing ODA</td>
<td>-6</td>
<td>-7</td>
<td>-9</td>
<td></td>
</tr>
<tr>
<td>+ Emergency and Distress Relief</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>+ Other ODA*</td>
<td>34</td>
<td>36</td>
<td>34</td>
<td>35</td>
</tr>
<tr>
<td><strong>Total Indicative Net ODA Needs for the MDGs</strong></td>
<td>65</td>
<td>135</td>
<td>152</td>
<td>195</td>
</tr>
<tr>
<td>as % of OECD-DAC Countries' GNI</td>
<td>0.23%</td>
<td>0.44%</td>
<td>0.46%</td>
<td>0.54%</td>
</tr>
<tr>
<td>ODA to Least Developed Countries (as % of OECD-DAC Countries' GNI)</td>
<td>0.06%</td>
<td>0.12%</td>
<td>0.15%</td>
<td>0.22%</td>
</tr>
</tbody>
</table>

**Absolute Increase in Net ODA Required (compared to 2002)**

<table>
<thead>
<tr>
<th></th>
<th>2002</th>
<th>2006</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difference Between Total Net ODA Needs and Existing Commitments</td>
<td>48</td>
<td>50</td>
<td>74</td>
</tr>
</tbody>
</table>

* Includes ODA that does not contribute directly to the MDGs and operating expenditures of donor agencies.
† This estimate does not include several important ODA needs, such as responding to crises of geopolitical importance, such as Afghanistan or Iraq; mitigating the impact of climate change; protecting biodiversity and conserving global fisheries; and so forth.

Source: UN Millennium Project (2005).

Assuming that high-income countries will meet the specific commitments they have already made to increasing aid, gross ODA volumes will need to rise by approximately $48 billion in 2006 beyond the level of existing commitments in order to meet the MDGs. I hasten to add that the donor countries should not plan to land short of their 0.7 percent commitment. Table 3's $195 billion estimate of net ODA flows in 2015 leaves out one potentially large expense: help for the poorest countries to adapt to long-term climate change that is under way and caused, in significant part, by the rich countries. With rising temperatures and ocean levels, changes in precipitation patterns, and an increasing frequency of extreme weather events, some highly populous parts of the developing world will require substantial assistance adjusting to climate change. Other kinds of ODA needs not yet foreseen will likely arise as well.

**How This Needs Assessment Compares With Others**

The UN Millennium Project is not alone in estimating the need for a doubling of ODA. Many estimates in recent years have converged around a similar level. In 2001, in the lead-up to the Monterrey Summit, a high-level commission chaired by former Mexican president Ernesto Zedillo estimated $50 billion per year, or a doubling of then-current official development assistance. The World Bank, using a very simplified methodology in the same year, also forecasted incremental aid needs at around $50 billion per year. In September 2003, the World Bank noted that low-income countries could immediately absorb some $30 billion per year of additional aid, given their absorptive capacity at the time, the concept we visited last chapter. In 2004, leaders of the UK and France called for a significant increase of foreign aid to achieve the Millennium Development Goals, roughly a doubling of ODA from 0.25 percent of donor GNP to around 0.5 percent of donor GNP.

UK Chancellor Gordon Brown in particular has shown great leadership in proposing ways to coordinate such an increase among the donor countries.
WHICH DONORS SHOULD PAY?

Let's examine the implications of expanded aid on a country-by-country basis. Suppose that foreign assistance for all purposes will have to rise to 0.5 percent of donor income during the period 2005 to 2015, roughly $140 billion per year at today's GNP. To give a sense of what that would imply for each donor country, figure 1 shows the change in net foreign aid from today's level, assuming each donor in the Development Assistance Committee moves this year to 0.5 percent of GNP. For the G-0.7 (the countries already at foreign assistance or above 0.7 percent of GNP), this would mean a drop in funding (certainly not recommended).

For the rest, it would mean a significant increase. The key point is that a few big countries would account for 90 percent of the increase. Of the total $75 billion or so rise in foreign aid (in 2003 dollars), 51 percent (roughly $38 billion) would be due from the United States. Japan would account for 18 percent (roughly $13 billion), and Germany, France, Italy, and the UK would account for 20 percent (roughly $15 billion).

The United States is the largest missing element in financing the Millennium Goals, almost half of the total foreign assistance shortfall.

The U.S. government has argued recently that development assistance from private U.S. citizens and the nonprofit sector (faith-based organizations, philanthropies, foundations, NGOs) makes up for much of the shortfall in official aid. The evidence at hand does not bear this out. The Development Assistance Committee of the OECD has compiled cross-country data on nongovernmental development assistance. The estimate for the United States is about $3 billion per year, an amount that raises the total U.S. development assistance from 0.15 percent of GNP to 0.18 percent of GNP, still leaving the United States at the very bottom of the donor list. The U.S. government also tried to argue, incredibly, that remittances of foreign workers in the United States back to their home country should somehow count as a form of aid. This is ridiculous. The remittances are the returns for work. They are no more a form of aid than are the remittances of U.S. profits from Mexico a form of aid from Mexico to the United States.

THE COSTS AFTER 2015

These calculations calibrate the needs through 2015 in order to achieve the Millennium Development Goals. The needs after 2015 would fall, quite significantly in many cases, and surely as a share of donor GNP. The reasons are straightforward, even if the post-2015 foreign aid needs cannot be calculated with any precision. By 2015, most of the developing world will have been freed from the poverty trap onto a path of self-sustaining growth. These countries will therefore "graduate" from the need for ODA to cofinance investments in basic needs. Extreme poverty will have been eliminated from China, and will encompass less than 20 percent of the population in India. In sub-Saharan Africa, the rate of extreme poverty will have declined from around 40 percent of the population today to under 20 percent.

Many of the key infrastructure investments will have been made, with massive improvements in roads, power grids, telecommunications, seaports, and airports. The extent of new investments needed to eliminate the remaining poverty will be much less than during the Millennium Development Goals phase. Although many public investments will
still be needed, the key thresholds to operate infrastructure networks should already have been met.

As the rich countries continue to get richer, the share of the extreme poor in the world population continues to decline, and the income of poor countries rises so that they can cover more of their own needs, there will gradually be a declining need for foreign assistance. In the Millennium Project’s calculation, the ODA needed to meet the Millennium Development Goals will be 0.5 percent of donor income in 2015. It will fall further in the following decade, and will therefore remain below the key political threshold of 0.7 percent during the entire period between 2005 and 2025.

**CAN THE UNITED STATES AFFORD 0.7 PERCENT OF GNP?**

The question is silly on its face. Can the United States manage an aid target that five other donor countries have already achieved, six more have scheduled, and all donors—including the United States—have promised “concrete efforts” to achieve? Of course it can, especially since I am speaking of much less than 1 percent of income. Think of it. To go from today’s donor assistance level of 0.15 percent of GNP to 0.7 percent of GNP would be an extra tax of 0.55 percent of GNP. With U.S. per capita GNP rising by around 1.9 percent per year, the extra amount represents less than one third of a single year’s growth of GNP. So, if the United States were on track to reach a $40,000 disposable income by, say, January 1, 2010, it would instead reach the same income on May 1, 2010, one third of a year later. This four-month lag in attaining a higher level of consumption would mean that a billion people would be given an economic future of hope, health, and improvement rather than a downward spiral of despair, disease, and decline.

People would hardly be weighed down by an extra 0.55 percent of income collected in taxes. But to make the increase in ODA truly imperceptible for the vast majority of Americans, the richest of the rich in the United States should be asked to pay their fair share to help the poorest in the world. Most of the world, including most Americans, does not appreciate how rich the superrich have become, and how disproportionately they have benefited from the economic and tax changes of the past two decades. The vast incomes of the superrich hit home for me a couple of years ago in the months preceding President Bush’s 2003 trip to Africa.

Some months before the trip, the Internal Revenue Service issued a special report on the richest taxpayers of the year 2000. It turned out that the top four hundred taxpayers had a combined income of $69 billion dollars, or $174 million dollars per taxpayer. As President Bush prepared to visit Africa, I made a back-of-the-envelope calculation, shown in table 4, to confirm that the four hundred richest U.S. taxpayers had a combined income in 2000 that exceeded the combined incomes of four of the countries on Mr. Bush’s tropical tour. The difference was astounding: the $57 billion in combined income of Botswana, Nigeria, Senegal, and Uganda in 2000 was the income of 161 million people, who average $350 in income per year, whereas the $69 billion was the income of four hundred individuals.

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Botswana</td>
<td>5</td>
</tr>
<tr>
<td>Nigeria</td>
<td>42</td>
</tr>
<tr>
<td>Senegal</td>
<td>4</td>
</tr>
<tr>
<td>Uganda</td>
<td>6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>57</strong></td>
</tr>
<tr>
<td><strong>400 Highest-Income Americans</strong></td>
<td><strong>60</strong></td>
</tr>
</tbody>
</table>

Source: Internal Revenue Service (2003); World Bank (2004).

The IRS reported that the superrich had enjoyed a sizable reduction in their tax payments as a percent of their incomes during the 1990s, but the best was yet to come. Three tax cuts from the Bush administration in 2001, 2002, and 2003 vitiated much of the progressivity of the tax code. The tax reform package signed into law scheduled the phase out of the estate tax, dropped the top tax bracket, and cut rates on dividends and capital gains. Together these changes enabled rich U.S. taxpayers with annual incomes above $200,000 to reap 37 percent of the total tax cut with an average $19,000 in annual tax savings. Since the total tax cut was on the order of $220 billion per year, the tax savings...
of the households above $500,000 per year, equal to 22.7 percent of the total tax savings, amounted to around $50 billion per year, more than enough for the United States to pay its share of the MDG needs! The details on the tax cut are shown in Table 5.

### Table 5: Tax Savings by Household Income in the Bush Administration Tax Cuts

<table>
<thead>
<tr>
<th>Category</th>
<th>Number of Tax-Paying Households (thousands)</th>
<th>Percent of Total Households</th>
<th>Tax Savings per Household ($/year)</th>
<th>Total Tax Savings in the Income Category ($/year)</th>
<th>Percent of Total Tax Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bottom 80 Percent</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incomes less than $75,000</td>
<td>114,151</td>
<td>79.5</td>
<td>533</td>
<td>60.87</td>
<td>28</td>
</tr>
<tr>
<td><strong>Top 20 Percent</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incomes between $75-100</td>
<td>11,395</td>
<td>7.9</td>
<td>2,224</td>
<td>25.34</td>
<td>11.6</td>
</tr>
<tr>
<td>Incomes between $100-200</td>
<td>13,281</td>
<td>9.3</td>
<td>3,905</td>
<td>51.86</td>
<td>23.8</td>
</tr>
<tr>
<td>Incomes between $200-500</td>
<td>3,339</td>
<td>2.3</td>
<td>9,012</td>
<td>30.09</td>
<td>13.8</td>
</tr>
<tr>
<td>Incomes between $500-1,000</td>
<td>527</td>
<td>0.4</td>
<td>27,150</td>
<td>14.31</td>
<td>6.6</td>
</tr>
<tr>
<td>More than $1,000</td>
<td>257</td>
<td>0.2</td>
<td>136,398</td>
<td>35.05</td>
<td>16.1</td>
</tr>
<tr>
<td>All</td>
<td>143,509</td>
<td>100</td>
<td>1,520</td>
<td>218.13</td>
<td>100</td>
</tr>
</tbody>
</table>


One of the stunning, and politically surprising, aspects of the Bush tax cuts is that they came after a generation in which the shift in income distribution had been immensely favorable to the superrich. The share of income of the top 1 percent of U.S. taxpayers soared from 8.2 percent in 1980 to 14.6 percent in 1998 (signifying, of course, that the income of the top 1 percent was 14.6 times the average income). The reason for this dramatic shift toward the rich is not really known. The surprise is that the political system amplified the shift through tax cuts that favored the rich, instead of offsetting these shifts through greater progressivity of the tax system and income transfers toward the poor.

Achieving 0.7 percent of GNP in official development assistance in the United States would hardly be a stretch. On the spending side of the budget, the United States spent as much in Iraq for two weeks of support for the war (about $2.5 billion) as it does for an entire year of economic development assistance in Africa. In its first two years, the Iraq war cost about $60 billion per year, roughly the same increment needed to reach 0.7 percent of GNP. The overall rise in military spending has been on the order of $150 billion per year, comparing fiscal year 2001 as President Bush came into office and fiscal year 2005, an increase of 1.5 percent of GNP.

Having made little headway with the Bush administration in advocating the promised concrete efforts toward 0.7 percent, I used the occasion of the Bush trip to Africa to appeal directly to the richest Americans for their personal contributions. Writing in The New York Times, I suggested that the superrich could apply their tax savings in recent years to the Global Fund to Fight AIDS, TB, and Malaria. "For individuals who already have all the earthly possessions that can possibly be amassed," I wrote, "could there be a better way to give meaning to vast wealth?"

The top four hundred richest taxpayers, I suggested, could give 10 percent of their 2000 income, or $6.9 billion. This would be enough to save millions of lives per year, for example, through the comprehensive control of malaria in Africa. Casting the net more widely, the top 0.1 percent of taxpayers, roughly one hundred thousand in all, could in effect return their tax cuts in the form of personal giving, for a sum of around $30 billion per year. I noted in the op-ed that Bill Gates had, in effect, already done his part, with a stunning gift of $23 billion (which has since been augmented) to establish the Bill and Melinda Gates Foundation. The Gates Foundation spends around 70 percent of its annual outlays on fighting disease in poor countries, and is making history in the process. Other extraordinarily generous philanthropists—among them George Soros, Rob Glaser, Gordon Moore, and Ed Scott—have acted similarly.

This is a noble start, but not yet the groundswell that the world needs. Real solutions will no doubt require a balance of philanthropy and taxation. A practical proposal would be the following:

A 5 percent income tax surcharge on incomes above $200,000 directed toward the U.S. contribution to end global poverty, which in 2004 would yield around $40 billion. That surcharge could be paid as a tax to support U.S. gov-
ernment efforts, or it could be directed by the taxpayer to a qualifying charity or philanthropy that has registered programs in support of the Millennium Development Goals.

There are powerful reasons to take these steps, both out of enlightened self-interest of the rich nations and out of a deeper human need at the individual level. We will look at both of those powerful reasons in a later chapter.

Sixteen

MYTHS AND MAGIC BULLETS

Verything up to this point is fine and good, except for one matter: it ignores the human factor. Take the case of Africa. Africa needs around $30 billion per year in aid in order to escape from poverty. But if we actually gave that aid, where would it go? Right down the drain if the past is any guide. Sad to say, Africa’s education levels are so low that even programs that work elsewhere would fail in Africa. Africa is corrupt and riddled with authoritarianism. It lacks modern values and the institutions of a free market economy needed to achieve success. In fact, Africa’s morals are so broken down that it is no surprise AIDS has run out of control. And here is the bleakest truth: Suppose that our aid saved Africa’s children. What then? There would be a population explosion, and a lot more hungry adults. We would have solved nothing.

If your head was just nodding yes, please read this chapter with special care. The paragraph above repeats conventional rich-world wisdom about Africa, and to a lesser extent, other poor regions. While common, these assertions are incorrect. Yet they have been repeated publicly for so long, or whispered in private, that they have become accepted as truths by the broad public as well as much of the development community, particularly by people who have never worked in Africa. I use the case of Africa because prejudices against Africa currently run so high, but the same attitudes were expressed about other parts of the world before those places achieved economic development and cultural prejudices could not hold up. Napoleon famously declared, “History is a