A Planet Under Stress: Rising to the Challenge

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We need to restructure our economy in order to save the environment—and we need to do it at wartime speed.

By Lester R. Brown

Early in this new century, the world is facing many long-standing social challenges, including hunger, illiteracy, and disease. If developing countries add nearly 3 billion people by mid-century, as projected, population growth will continue to undermine efforts to improve the human condition. The gap between the billion richest and the billion poorest will continue to widen, putting even more stress on the international political fabric.

As a species, our failure to control our numbers is taking a frightening toll. Slowing population growth is the key to eradicating poverty and its distressing symptoms, and, conversely, eradicating poverty is the key to slowing population growth. With time running out, the urgency of moving simultaneously on both fronts seems clear.

The challenge is to create quickly the social conditions that will accelerate the shift to smaller families. Among these conditions are universal education, good nutrition, and prevention of infectious diseases. We now have the knowledge and resources to reach these goals. In an increasingly integrated world, we also have a vested interest in doing so.

Historically, we have lived off the interest generated by the earth's natural capital assets, but now we are consuming those assets themselves. We have built an environmental bubble economy, one where economic output is artificially inflated by overconsumption of the earth's natural assets. The challenge today is to deflate the bubble before it bursts.

Keeping the bubble from bursting will require an unprecedented de-

Above: A denuded forest. "Business as usual" leads to environmental degradation. Factoring in *all* the costs of cutting down a tree gives a more complete picture of its worth. It might be cheaper to let the trees stand.

gree of international cooperation to stabilize population, climate, water tables, and soils—and at wartime speed. Indeed, in both scale and urgency the effort required is comparable to U.S. mobilization during World War II.

Our only hope now is rapid systemic change—change based on market signals that tell the ecological truth. This means restructuring the tax system: lowering income taxes and raising taxes on environmentally destructive activities, such as fossil fuel burning, to incorporate the ecological costs. Unless we can get the market to send signals that reflect reality, we will continue making faulty decisions as consumers, corporate planners, and government policy makers. Ill-informed economic decisions and the economic distortions they create can lead to economic decline.

Continuing with business as usual offers an unacceptable outcome—continuing environmental degradation and disruption and a bursting of the economic bubble. The warning signals are coming more frequently, whether they be collapsing fisheries, melting glaciers, or falling water tables. Thus far the wake-up calls have been local, but soon they could become global, and time is running out. Bubble economies, which by definition are artificially inflated, do not continue indefinitely. Our demands on the earth exceed its regenerative capacity by a wider margin with each passing day.

Deflating the Bubble

Stabilizing world population at about 7.5 billion is central to avoiding economic breakdown in countries with large projected population increases that are already overconsuming their natural capital assets. Some 36 countries, all in Europe except Japan, have essentially stabilized their populations. The challenge now is to create the economic and social conditions and to adopt the priorities that will lead to population stability in all remaining countries. The keys here are extending primary education to all children, providing vaccinations and basic health care, and offering reproductive health care and family-planning services in all countries.

Shifting from a carbon-based to a hydrogen-based energy economy to stabilize climate is now technologically possible. Advances in wind turbine design and in solar cell manufacturing, the availability of hydrogen generators, and the evolution of fuel cells provide the technologies needed to build a climate-benign hydrogen economy. Moving quickly from a carbon-based to a hydrogen-based energy economy depends on getting the price right and on incorporating the indirect costs of burning fossil fuels into the market price.

Iceland is the first country to adopt a national plan to convert its carbon-based energy economy to one based on hydrogen. Denmark now gets 18% of its electricity from wind turbines and plans to increase this to 40% by 2030. Japan leads the world in electricity generation from solar cells. The Netherlands leads the industrial world in exploiting the bicycle as an alternative to the automobile. The Canadian province of Ontario is emerging as a leader in phasing out coal. It plans to replace its five coal-fired power plants with gas-fired plants, wind farms, and efficiency gains. This initiative calls for the first plant to close in 2005 and the last one in 2015. The resulting reduction in carbon emissions is equivalent to taking 4 million cars off the road.

Stabilizing water tables depends on quickly raising water productivity. It is difficult to overstate the urgency of this effort. Failure to stop the fall in water tables by systematically reducing water use will lead to the depletion of aquifers, an abrupt cutback in water supplies, and the risk of a precipitous drop in food production. By pioneering in drip irrigation technology, Israel has become the world leader in the efficient use of agricultural water. This unusually labor-intensive irrigation practice, now being used to produce high-value crops in many countries, is ideally suited where water is scarce and labor is abundant.

With soil erosion, we have no choice but to reduce the loss to the rate of new soil formation or below. The only alternative is a continuing decline in the inherent fertility of eroding soils and cropland abandonment. South Korea, with once denuded mountainsides and hills now covered with trees, has achieved a level of flood control, water storage, and hydrological stability that is a model for other countries. In the United States as well, farmers have reduced soil erosion by nearly 40% in less than two decades thanks to a combination of several programs and practices.

Thus all the things we need to do to keep the bubble from bursting are now being done in at least a few countries. If these highly successful initiatives are adopted worldwide, and quickly,we can deflate the bubble before it bursts,similar to the way U.S. mobilization helped lead Allied forces to victory in less than four years.

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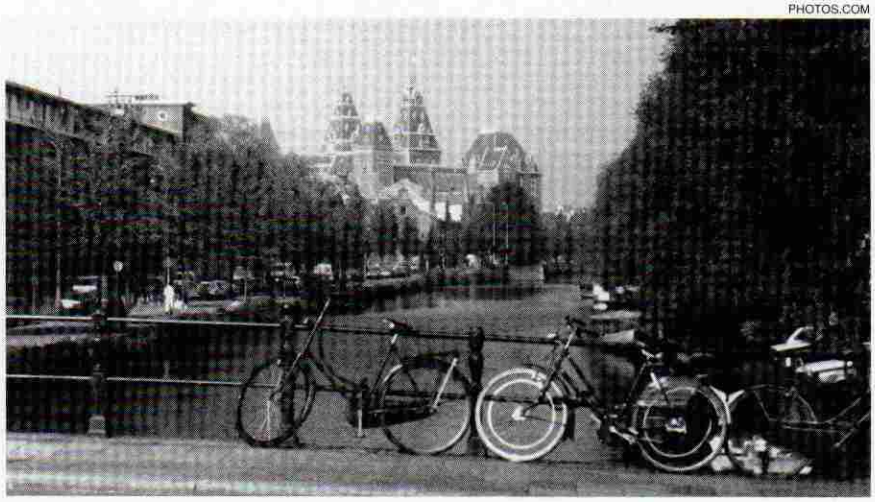

Bicycles along an Amsterdam canal. The Netherlands leads the industrial world in bicycling as an alternative to driving. Up to 40% of all trips are taken by bicycle in Amsterdam.

"The world can restructure its economy quickly if it is convinced of the need to do so."

In retrospect, the speed of the conversion from a peacetime to a wartime economy at the beginning of World War II was stunning. One month after Pearl Harbor, President Roosevelt announced plans to produce 60,000 planes, 45,000 tanks, 20,000 antiaircraft guns, and 6 million tons of merchant shipping. The automobile industry went from producing nearly 4 million cars in 1941 to producing 24,000 tanks and 17,000 armored cars in 1942—but only 223,000 cars, and most of which were produced early in the year, before the conversion began. Essentially the auto industry was closed down from early 1942 through the end of 1944. In 1940, the United States produced some 4,000 aircraft. In 1942, it produced 48,000. By the end of the war, more than 5,000 ships were added to the 1,000 that made up the American Merchant Fleet in 1939.

Various other firms likewise converted. A sparkplug factory switched to producing machine guns; a manufacturer of stoves produced lifeboats; a merry-go-round factory made gun mounts; a toy company turned out compasses; a corset manufacturer produced grenade belts; and a pinball machine plant began to make armor-piercing shells.

This mobilization of resources within a matter of months demonstrates that a country and, indeed, the world can restructure its economy quickly if it is convinced of the need to do so.

Creating an Honest Market

The key to restructuring the economy is the creation of an honest market, one that tells the ecological truth. The market has three fundamental weaknesses: It does not incorporate the indirect costs of providing goods or services into prices. It does not value nature's services properly. It does not respect the sustainable-yield thresholds of natural systems such as fisheries, forests, rangelands, and aquifers.

As the global economy has expanded and as technology has evolved, the indirect costs of some products have become far larger than the price fixed by the market. The price of a gallon of gasoline, for instance, includes the cost of production but not the expense of treating respiratory illnesses from breathing polluted air or the repair bill from acid rain damage. Nor does it cover the cost of rising global temperature, ice melting, more destructive storms, or the relocation of millions of refugees forced from their homes by sea-level rise.

If we have learned anything over the last few years, it is that accounting systems that do not tell the truth can be costly. Faulty corporate accounting systems that overstate income or leave costs off the books have driven some of the world's largest corporations into bankruptcy, costing millions of people their lifetime savings, retirement incomes, and jobs.

Unfortunately, we also have a faulty economic accounting system at the global level, but with potentially far more serious consequences. Economic prosperity is achieved in part by running up ecological deficits, costs that do not show up on the books, but costs that someone will eventually pay. Some of the record economic prosperity of recent decades has come from consuming the earth's productive assets and from destabilizing its climate.

No one has attempted to assess fully the worldwide costs of rising temperature and then to allocate them by gallon of gasoline or ton of coal. A summary of eight studies done during the 1990s indicates that, if the price were raised enough to make drivers pay some of the indirect costs of automobile use, a gallon of gas would cost anywhere from $3.03 to $8.64, with the variations largely due to how many indirect costs were covered. For example, some studies included the military costs of protecting petroleum supply lines and ensuring access to Middle Eastern oil, while others did not. No studies, unfortunately, incorporated all the costs of using gasoline—including the future inundation of coastal cities, island countries, and rice-growing river floodplains.

Not only are some of the looming costs associated with continued fossil fuel burning virtually incalculable, but the outcome is unacceptable. What is the cost of inundating half of Bangladesh's riceland by a one-meter rise in sea level? How much is this land worth in a country that is the size of New York state and has a population half that of the United States? And what would be the cost of relocating the 40 million Bangladeshis who would be displaced by the one-meter rise in sea level? Would they be moved to another part of the country? Or would they migrate to less densely populated countries, such as the United States, Canada, Australia, or Brazil?

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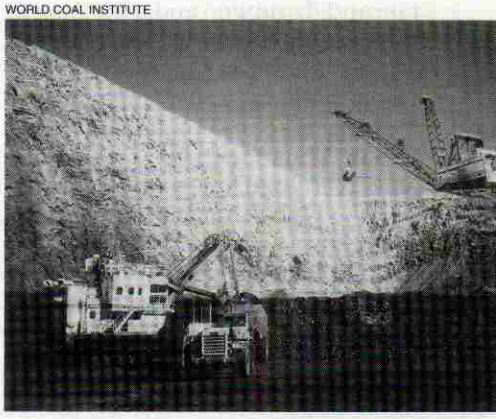

Surface coal mining in Australia. Taxes on coal that include health-care costs, costs of damage from acid rain, and costs of climate disruptions would more accurately reflect the costs to society of coal mining, according to Brown.

Another challenge in creating an honest market is to get it to value nature's services. For example, after several weeks of flooding in the Yangtze River basin in 1998 inflicted $30 billion worth of damage, the Chinese government announced that it was banning all tree cutting in the basin. It justified the ban by saying that trees standing are worth three

times as much as trees cut.

Once we calculate all the costs of a product or service, we can incorporate them into market prices by restructuring taxes. If we can get the market to tell the truth, then we can avoid being blindsided by faulty accounting systems that lead to bankruptcy.

Taxing Indirect Costs

The need for tax shifting—lowering income taxes while raising taxes on environmentally destructive activities—in order to get the market to tell the truth has been widely endorsed by economists. The basic idea is to establish a tax that reflects the indirect costs to society of an economic activity. For example, a tax on coal would incorporate the increased health-care costs associated with breathing polluted air, the costs of damage from acid rain, and the costs of climate disruption.

Among the activities taxed in Europe are carbon emissions, emissions of heavy metals, and the generation of garbage (so-called landfill taxes). The Nordic countries, led by Sweden, pioneered tax shifting at the beginning of the 1990s. By 1999, a second wave of tax shifting was under way, this one including the larger economies of Germany, France, Italy, and the United Kingdom. Tax shifting does not change the level of taxes, only their composition. One of the better known changes was a four-year plan adopted in Germany in 1999 to shift taxes from labor to energy. By 2001, this had lowered fuel use by 5%. A tax on carbon emissions adopted in Finland in 1990 lowered emissions there 7% by 1998.

There are isolated cases of environmental tax reform elsewhere. The United States, for example, imposed a stiff tax on chlorofluorocarbons to phase them out in accordance with the Montreal Protocol of 1987. At the local level, the city of Victoria, British Columbia, adopted a trash tax of $1.20 per bag of garbage, reducing its daily trash flow 18% within one year.

One of the newer taxes gaining in popularity is the so-called congestion tax. City governments are turning to a tax on vehicles entering the city, or at least the inner part of the city where traffic congestion is most serious. In London, where the average speed of an automobile was nine miles per hour—about the same as a horse-drawn carriage—a congestion tax was adopted in early 2003. The £5 ($8) charge on all motorists driving into the center city between 7 a.m. and 6:30 p.m. immediately reduced the number of vehicles by 24%, permitting traffic to flow more freely while cutting pollution and noise.

Environmental tax shifting usually brings a double dividend. In reducing taxes on income, labor becomes less costly, creating additional jobs while protecting the environment. This was the principal motivation in the German four-year shift of taxes from income to energy. The shift from fossil fuels to more energy-efficient technologies and to renewable sources of energy reduces carbon emissions and represents a shift to more labor-intensive industries. By lowering the air pollution from smokestacks and tailpipes, it also reduces respiratory illnesses, such as asthma and emphysema, and healthcare costs—a triple dividend.

When it comes to reflecting the value of nature's services, ecologists can calculate the values of services that a forest in a given location provides. Once these are determined, they can be incorporated into the price of trees as a stumpage tax of the sort that Bulgaria and Lithuania have adopted. Anyone wishing to cut a tree would have to pay a tax equal to the value of the services provided by that tree. The market would then be telling the truth. The effect of this would be to reduce tree cutting, since forest services may be worth several times as much as the timber, and to encourage wood and paper recycling.

Some 2,500 economists, including eight Nobel Prize winners in economics, have endorsed the concept of tax shifts. Former Harvard economics professor N. Gregory Mankiw, chairman of the President's Council of Economic Advisers, wrote in *Fortune* magazine: "Cutting income taxes while increasing gasoline taxes would lead to more rapid economic growth, less traffic congestion, safer roads, and reduced risk of global warming—all without jeopardizing long-term fiscal solvency. This may be the closest thing to a free lunch that economics has to offer." Mankiw could also have added that it would reduce the military expenditures associated with ensuring access to Middle Eastern oil.

The Economist has recognized the advantage of environmental tax shifting and endorses it strongly: "On environmental grounds, never mind energy security, America taxes gasoline too lightly. Better than a one-off increase, a politically more feasible idea, and desirable in its own terms, would be a long-term plan to shift taxes from incomes to emissions of carbon." In Europe and the United States, polls indicate that at least 70% of voters support environmental tax reform once it is explained to them.

AFP PHOTO / NICOLAS ASFOURI

A London double-decker bus passes a congestion charge sign painted on the ground. Beginning in February 2003, motorists entering the city center between 7 a.m. and 6:30 p.m. must pay £5 ($8), a move aimed at cutting traffic and pollution.

Shifting Subsidies

Each year the world's taxpayers underwrite $700 billion of subsidies for environmentally destructive activities, such as fossil fuel burning, overpumping aquifers, clear-cutting forests, and overfishing. A 1997 Earth Council study, *Subsidizing Unsustainable Development*, observes that "there is something unbelievable about the world spending hundreds of billions of dollars annually to subsidize its own destruction."

Iran provides a classic example of extreme subsidies when it prices oil for internal use at one-tenth the world price, strongly encouraging the consumption of gasoline. The World Bank reports that if this $3.6 billion annual subsidy were phased out it would reduce Iran's carbon emissions by a staggering 49%. It would also strengthen the economy by freeing up public revenues for investment in the country's economic and social development. Iran is not alone. The Bank reports that removing energy subsidies would reduce carbon emissions in Venezuela by 26%, in Russia by 17%, in India by 14%, and in Indonesia by 11%.

Some countries are eliminating or reducing these climate-disrupting subsidies. Belgium, France, and Japan have phased out all subsidies for coal. Germany reduced its coal subsidy from $5.4 billion in 1989 to $2.8 billion in 2002, meanwhile lowering its coal use by 46%. It plans to phase them out entirely by 2010. China cut its coal subsidy from $750 million in 1993 to $240 million in 1995. More recently, it has imposed a tax on high-sulfur coals. Together these two measures helped to reduce coal use in China by 5% between 1997 and 2001 while the economy was expanding by one-third.

The environmental tax shifting described earlier reduces taxes on wages and encourages investment in such activities as wind electric generation and recycling, thus simultaneously boosting employment and lessening environmental destruction. Eliminating environmentally destructive subsidies reduces both the burden on taxpayers and the destructive activities themselves.

Subsidies are not inherently bad. Many technologies and industries were born of government subsidies. Jet aircraft were developed with military R&D expenditures, leading to modern commercial airliners. The Internet was a result of publicly funded efforts to establish links between computers in government laboratories and research institutes. And the combination of the federal tax incentive and a robust state tax incentive in California gave birth to the modern wind power industry.

But just as there is a need for tax shifting, there is also a need for subsidy shifting. A world facing the prospect of economically disruptive climate change, for example, can no longer justify subsidies to expand the burning of coal and oil. Shifting these subsidies to the development of climate-benign energy sources such as wind power, solar power, and geothermal power is the key to stabilizing the earth's climate. Shifting subsidies from road construction to rail construction could increase mobility in many situations while reducing carbon emissions.

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In a troubled world economy facing fiscal deficits at all levels of government, exploiting these tax and subsidy shifts with their double and triple dividends can help balance the books and save the environment. Tax and subsidy shifting promise both gains in economic efficiency and reductions in environmental destruction, a win-win situation.

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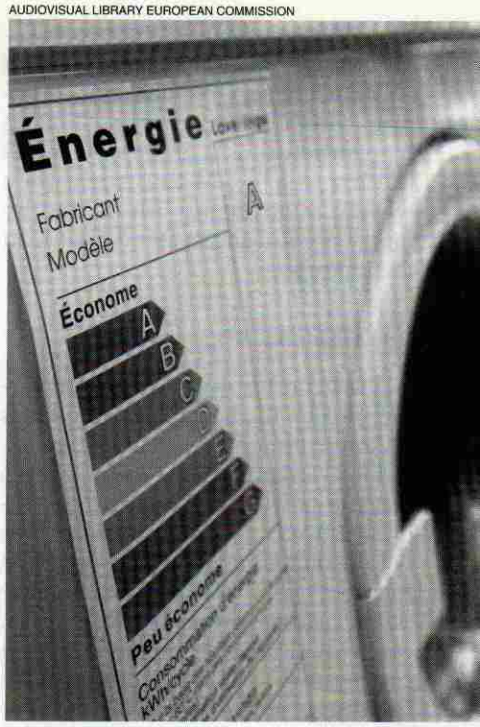

European Union progress. Home appliances consume on average 27% less energy than before thanks to directives established by the European Union.

A Call to Greatness

There is a growing sense among the more thoughtful political and opinion leaders worldwide that business as usual is no longer a viable option and that, unless we respond to the social and environmental issues that are undermining our future, we may not be able to avoid economic decline and social disintegration. The prospect of failing states is growing as mega-threats such as the HIV epidemic, water shortages, and land hunger threaten to overwhelm countries on the lower rungs of the global economic ladder. Failed states are a matter of concern not only because of the social costs to their people but also because they serve as ideal bases for international terrorist organizations.

We have the wealth to achieve these goals. What we do not yet have is the leadership. And if the past is any guide to the future, that leadership can only come from the United States. By far the wealthiest society that has ever existed, the United States has the resources to lead this effort. Economist Jeffrey Sachs sums

it up well: "The tragic irony of this moment is that the rich countries are so rich and the poor so poor that a few added tenths of one percent of GNP from the rich ones ramped up over the coming decades could do what was never before possible in human history: ensure that the basic needs of health and education are met for all impoverished children in this world. How many more tragedies will we suffer in this country before we wake up to our capacity to help make the world a safer and more prosperous place not only through military might, but through the gift of life itself?"

JHU/CCP / PHOTOSHARE

A health worker administers a tetanus vaccination to a woman in Jordan.
One of the keys to stabilizing populations—fundamental to avoiding worldwide economic breakdown—is providing vaccinations and basic health care for everyone, says author Brown.

The additional external funding needed to achieve universal primary education in the 88 developing countries that require help is conservatively estimated by the World Bank at $15 billion per year. Funding for an adult literacy program based largely on volunteers is estimated at $4 billion. Providing for the most basic health care is estimated at $21 billion by the World Health Organization. The additional funding needed to provide reproductive health and family planning services to all women in developing countries is $10 billion a year.

Closing the condom gap and providing the additional 9 billion condoms needed to control the spread of HIV in the developing world and eastern Europe requires $2.2 billion—$270 million for condoms and $1.9 billion for AIDS prevention education and condom distribution. The cost per year of extending school lunch programs to the 44 poorest countries is $6 billion per year. An additional $4 billion per year would cover the cost of assistance to preschool children and pregnant women in these countries.

In total, this comes to $62 billion. If the United States offered to cover one-third of this additional funding, the other industrial countries would almost certainly be willing to provide the remainder, and the worldwide effort to eradicate hunger, illiteracy, disease, and poverty would be under way.

This reordering of priorities means restructuring the U.S. foreign policy budget. Stephan Richter, editor of *The Globalist*, notes, "There is an emerging global standard set by industrialized countries, which spend $1 on aid for every $7 they spend on defense. . . . At the core, the ratio between defense spending and foreign aid signals whether a nation is guided more by charity and community—or by defensiveness." And then the punch line: "If the United States were to follow this standard, it would have to commit about $48 billion to foreign aid each year." This would be up from roughly $10 billion in 2002.

The challenge is not just to alleviate poverty, but in doing so to build an economy that is compatible with the earth's natural systems—an eco-economy, an economy that can sustain progress. This means a fundamental restructuring of the energy economy and a substantial modification of the food economy. It also means raising the productivity of energy and shifting from fossil fuels to renewables. It means raising water productivity over the next half century, much as we did land productivity over the last one.

This economic restructuring depends on tax restructuring, on getting the market to be ecologically honest. Hints of what might lie ahead came from Tokyo in early 2003 when Environment Minister Shunichi Suzuki announced that discussions were to begin on a carbon tax, scheduled for adoption in 2005. The benchmark of political leadership in all countries will be whether or not leaders succeed in restructuring the tax system.

It is easy to spend hundreds of billions in response to terrorist threats, but the reality is that the resources needed to disrupt a modern economy are small, and a Department of Homeland Security, however heavily funded, provides only minimal protection from suicidal terrorists. The challenge is not just to provide a high-tech military response to terrorism, but to build a global society that is environmentally sustainable, socially equitable, and democratically based—one where there is hope for everyone. Such an effort would more effectively undermine the spread of terrorism than a doubling of military expenditures.

We can build an economy that does not destroy its natural support systems, a global community where the basic needs of all the earth's people are satisfied, and a world that will allow us to think of ourselves as civilized. This is entirely doable. To paraphrase Franklin Roosevelt at another of those hinge points in history, let no one say it cannot be done.

The choice is ours—yours and mine. We can stay with business as usual and preside over a global bubble economy that keeps expanding until it bursts, leading to economic decline. Or we can be the generation that stabilizes population, eradicates poverty, and stabilizes climate. Historians will record the choice, but it is ours to make. □

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This article draws from his book *Plan B: Rescuing a Planet Under Stress and a Civilization in Trouble*, available from the Futurist Bookshelf, www.wfs.org/bkshelf.htm.

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