

25th Anniversary Edition

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STATE OF THE WORLD

*Innovations for a
Sustainable Economy*

Decision-Maker Briefs



THE WORLDWATCH INSTITUTE

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STATE OF THE WORLD

Innovations for a Sustainable Economy

Decision-Maker Briefs

Gary Gardner and Thomas Prugh, *Project Directors*

State of the World Decision-Maker Briefs

Worldwatch's flagship publication, *State of the World*, has informed decision makers around the world about trends in sustainable development since 1984. The book has been published in 36 languages, and over the years it has authoritatively assessed a wide range of issues, including population, energy, water, agriculture, environmental health, and trade. Topics are covered from a global, interdisciplinary perspective, and the stress is on innovation and problem solving. *State of the World* is widely used in university classrooms, cited in the news media, and looked to for timely insights by government officials.

The *State of the World Decision-Maker Briefs*, produced here for the first time, are intended to provide busy decision makers with a quick digest of the most important takeaways from *State of the World*—focusing on cutting-edge innovations for solving the world's most pressing environmental problems.

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Table of Contents

Chapter 1. Seeding the Sustainable Economy

Alternatives to business-as-usual can steer most economies onto sustainable paths. Underpinned by a handful of key Big Ideas, economic innovations might just remake our world.

Chapter 2. A New Bottom Line for Progress

Metrics other than GDP are being developed to better measure the things people most value.

Chapter 3. Rethinking Production

Leading-edge businesses are inventing ways to meet people's needs with a fraction of the environmental impacts.

Chapter 4. The Challenges of Sustainable Lifestyles

Overworked and indebted consumers are increasingly open to a focus on quality of life rather than more stuff.

Chapter 5. Meat and Seafood: The Most Costly Ingredients in the Global Diet

Alternative ways of meeting demand for meat and fish can protect the environment and small farmers.

Chapter 6. Building a Low-Carbon Economy

Improved energy productivity, deployment of renewable energy technologies, and enlightened government energy policies are key to reducing global carbon emissions.

Chapter 7. Improving Carbon Markets

Carbon is quickly emerging as a multi-billion-dollar commodity. This explosive growth in carbon markets presents both risks and opportunities for the economy and the planet.

Chapter 8. Water in a Sustainable Economy

Market mechanisms and enlightened regulations can supply water to all claimants, even as they reduce waste and protect aquatic ecosystems.

Chapter 9. Banking on Biodiversity

When linked to conservation goals, market mechanisms can protect natural capital while providing regulated access to important economic resources.

Chapter 10. The Parallel Economy of the Commons

As uncontrolled access to the commons degrades resources such as fisheries and the atmosphere, the use of commons regimes to sustainably conserve and allocate scarce resources is critical.

Chapter 11. Engaging Communities for a Sustainable World

Case studies illuminate what's possible in creating sustainability at the grassroots.

Chapter 12. Mobilizing Human Energy

Successful cases of grassroots-led development around the world hold important lessons for governments.

Chapter 13. Investing for Sustainability

Financing activities at all levels—venture capital, socially responsible investing, and microfinance—are being examined for their potential contributions to building sustainable economies.

Chapter 14. New Approaches to Trade Governance

Reforms of the WTO and the broader global trading system could help promote sustainable economic activity.

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STATE OF THE WORLD 2008

Seeding the Sustainable Economy

Chapter 1

Key Messages

- Innovations in business, government, and civil society suggest that a new kind of economy—a sustainable economy—is struggling to be born.
- These innovations seek to address environmental degradation and social and economic problems created by conventional economic activity.
- A broad set of principles can be used to steer conventional economic activity onto a sustainable path.

The Problem

Economic activity in the 20th century generated more wealth for more people than in any other period in human history. But it also produced widespread environmental degradation, and the prosperity it generated bypassed a large share of the world's people. Three serious global challenges illustrate the failure of economies, as conventionally conceived, to care for the environment and meet the needs of all people: climate change, biodiversity loss, and economic inequality.

Climate change. Human economic activities generate greenhouse gas emissions that are changing our planet's climate. And climate change carries costs: the 2006 Stern Report to the U.K. government estimated the climate impact of “business-as-usual” economic activity over the 21st century to range from 5 percent of global GDP (direct costs) to 20 percent (direct and indirect costs). In contrast, the report estimated the cost of climate *action* at about 1 percent of global GDP. The Intergovernmental Panel on Climate Change (IPCC) estimate was even lower, at about 0.1 percent of global GDP. In other words, it appears to be far cheaper to address climate change than to not.

Biodiversity loss. Economic activity has also taken an enormous toll on biodiversity over the past half century, according to the *Millennium Ecosystem Assessment* produced for the United Nations. Species extinction rates increased to at least 50 to 500 times the natural rate, for example, while 20 percent of the world's coral reefs were lost. The report also documented the economic toll of such losses: some 39 countries experienced a decline of 5 percent or more in wealth (measured as net savings) when biodiversity loss, resource depletion, and carbon damage



Fernando Doutei

Honeybee pollination of key agricultural crops is worth \$19 billion a year in the United States alone. Nature's contributions to economies are increasingly being factored into economic decision-making through administrative and market mechanisms.

were taken into account. For 10 countries, the decline ranged from 25 to 60 percent.

Economic inequality. Wealth generated by conventional economic activity has failed to reach a large share of the world's poor. Despite an 18-fold increase in total global economic activity between 1900 and 2000, some 40 percent of the global population lived on just \$2 per day or less at the start of the 21st century, with wealth skewed in favor of early industrializing nations. (See Table.) In addition, one in eight people in the world was chronically hungry in 2001–03, while one in five lacked access to clean water, and two in five lacked adequate sanitation. Meanwhile, the U.N. Development Programme reported that in 2006, the combined income of the world's 500 richest people was about the same as the income of the world's 416 million poorest people.

Innovations/Solutions

In response to these and other vulnerabilities produced by conventional economies, businesses, governments, and nongovernmental organizations are producing a great many innovations to make economic activity more sustainable. The list of trailblazing experiments ranges from environmental taxes in Europe and cars designed for remanufacture

to cap-and-trade carbon markets, microfinance for the very poor, and product take-back laws.

In order to reach a tipping point where most economic activity is environmentally and socially sustainable, business people, policymakers, and consumers will need to embrace the following guiding principles:

- **Adjust economic scale.**

Economic activity often demands more resources and generates more waste than many ecosystems can support. But economies can be better designed to deliver what people need at a lower environmental cost. Caps on carbon emissions and electricity generated from renewable rather than fossil energy sources, for example, help to lower the environmental impact of energy generation.

- **Shift from growth to development.** The dominant imperative of modern economic activity is growth. Yet growth for its own sake may, on one hand, promote harmful excesses such as obesity or consumer debt, or on the other, neglect the needs of society's poorest. Sustainable development requires that the goal of wealth generation be augmented by an emphasis on wellbeing. Initiatives like microcredit, for example, are meant to ensure that the poor can participate more fully in economic activity. For the prosperous, extended parental leave and shorter work weeks can be used to boost quality of life.

- **Make prices tell the ecological truth.** Prices of goods and services are often distorted through taxes and subsidies that hide their environmental cost. Re-designing fiscal policy around ecotaxes—such as a carbon tax, for example—can reveal and reduce the environmental toll of economic activity. Another innovative fiscal tool is “feebates”—fees on environmentally burdensome consumption—combined with subsidies for environmentally friendly economic activity. Congestion fees on vehicles in London and Stockholm, for example, make rush-hour driving expensive while lowering the price of public transport.

- **Account for nature's contributions.** Economic actors have largely taken for granted many of the services generated

Net Worth Per Person, by Country Income Group, 2000

Country Group	Net Worth per Person (dollars in purchasing power parity)	Share of World Net Worth per Person (percent)
High-income OECD*	113,675	64
High-income non-OECD*	91,748	3
Upper middle-income	21,442	9
Lower middle-income	12,436	16
Low-income	5,485	8
World	26,421	100

*Organisation for Economic Co-operation and Development.

by ecosystems, from the flood prevention services of mangroves to pollination by bees. Properly valuing these services, through taxes and subsidies, can create an incentive structure that helps conserve biodiversity.

- **Apply the precautionary principle.** Most economic activity in the 20th century was assumed to be safe unless proven otherwise. The precautionary principle turns this thinking on its head, placing the burden of proof on companies or others who introduce a new technology or practice. The principle has been

adopted by governments from the European Union to the Los Angeles School Board and the city of San Francisco.

- **Revitalize commons management.** Many “open-access” resources, such as oceans, the atmosphere, and some forests, are overexploited in the absence of rules for their sustainable development. Some people argue that better management would emerge from privatization of these resources, while others advocate government ownership. But a third alternative—commons management administered by public trusts—has emerged as a viable option.

- **Value women.** Most of the world's poor are women, and most women are poor. Attention to women's access to land, credit, and equal pay would help lift an economically important constituency out of poverty and stoke economic activity.

Looking Ahead

Governments, businesses, and non-governmental organizations (NGOs) are stepping up to implement these seven principles, often in collaboration. Governments, for example, are shaping markets for carbon, wetlands, and species conservation that can facilitate sustainable business. NGOs are working with food companies to advance sustainable food production. And businesses are partnering with NGOs and governments to advance renewable energy technologies. Continued participation by all three major societal sectors is an encouraging sign that sustainable economies could be built sooner rather than later.

This brief is based on Chapter 1, “Seeding the Sustainable Economy,” by Gary Gardner and Thomas Prugh, published in the Worldwatch Institute report *State of the World 2008: Innovations for a Sustainable Economy*.

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A New Bottom Line for Progress

Chapter 2

Key Messages

- Gross domestic product (GDP), the dominant measure of economic activity in virtually all countries, is not an accurate metric of societal progress.
- New indicators have emerged that better describe the social and environmental dimensions of societal advance.
- As citizens demand that economies do a better job of dealing with today's environmental and social crises, these new indicators could be useful tools for evaluating modern economic progress.

The Problem

Gross domestic product (GDP) is increasingly recognized as an inadequate measure of the success of an economy, for three reasons: 1) it fails to account for a large amount of economic activity important to many economies, such as unpaid housework and volunteer activities; 2) it does not account for the loss of human and natural capital, as when people are killed in wars, or when forests or species are lost to economic activity; and 3) it includes expenditures that add no new value to an economy, but only remediate a problem created by earlier economic activities. The clean-up of an oil spill, or medical expenditures for avoidable obesity, are examples of these expenditures.

Consider, for instance, the GDPs of Sudan, Sri Lanka,

and the United States between 2000 and 2005. In each case, GDP rose, despite drought and genocide in Sudan, civil war in Sri Lanka, and in the United States, record defense expenditures, Hurricane Katrina, and a 77-year high in income inequality. (See Figure.) Moreover, growth in the two more seriously afflicted countries was greater than in the United States. Does GDP really reflect the true state of societal advance in these countries?

In response to the grim realities of climate change, resource depletion, collapsing ecosystems, and economic vulnerability, a new economic system is needed where progress is measured by improvements in wellbeing rather than by expansion of the scale and scope of market economic activity.

Innovations/Solutions

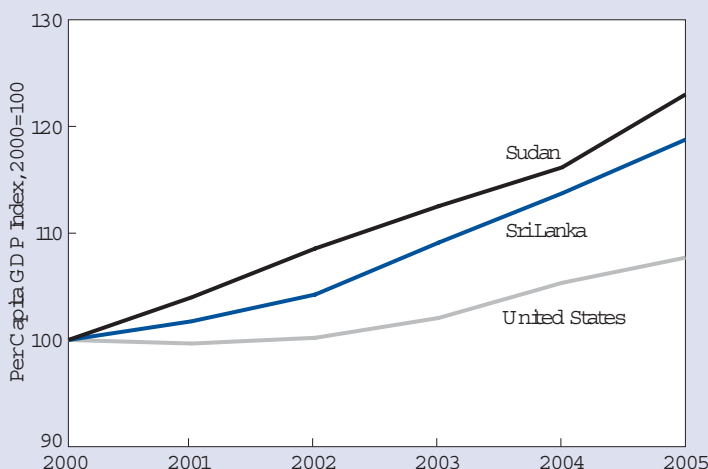
Alternative measures of economic progress can be divided into two sets: macro-indicators covering genuine human progress and the restoration of human and natural capital; and micro-indicators covering business and community-level sustainability.

Macroeconomic Indicators

One alternative measure of societal advance is the Genuine Progress Indicator (GPI), which adjusts a nation's personal consumption expenditures upward to account for beneficial nonmarket activities such as volunteering and parenting, and downward to account for costs associated with income inequality, environmental degradation, and international debt. GPI is increasingly at variance with GDP: in the United States in 2004, GDP stood at \$10.8 trillion, while GPI was only \$4.4 trillion. This suggests that well over half of the economic activity in the United States that year did not contribute to genuine progress. China began to institute a GPI-like measurement but abandoned the effort in 2007. Preliminary results of the program suggested that pollution-adjusted growth rates in some provinces were essentially zero.

Another measure, known as "ecological footprint" analysis, measures the environmental impact of economic activity against the biological capacity of the planet to support such activity. According to the Global Footprint Network, humanity's global ecological footprint exceeds

Per Capita GDP in Sudan, Sri Lanka, and the United States





Bhutan measures its national progress not in terms of economic growth, but by an indicator the country refers to as “gross national happiness” (GNH). The four pillars of GNH, based on Buddhist spiritual principles, are equity, preservation of cultural values, conservation of the natural environment, and establishment of good governance.

the planet’s capacity to absorb human activities by about 25 percent, implying that we need about 1.25 Earths to sustain present patterns of consumption.

Other macro-indicators are based in part on measures of human wellbeing. The Happy Planet Index, developed in the United Kingdom, compares happiness and life expectancy against environmental health to give a measure of “the ecological efficiency with which people achieve long and happy lives.” And the government of Bhutan has used its own measure of national wellbeing, Gross National Happiness, since 1972.

In all, a recent global assessment found green macro-accounting programs in place in at least 50 countries and identified at least 20 others that were planning to initiate such programs soon.

Microeconomic Indicators

Measures at the micro-level focus on key dimensions of local sustainability, including sustainability certification, zero waste, eco-efficiency, workplace wellbeing, and community vitality. These cover yardsticks such as share of a business’ inputs procured from certified sources, recycling rates, emissions levels, job satisfaction among workers, local procurement, and living wage ratio.

A comprehensive tool for such accounting is the Global

Reporting Initiative (GRI), now the world’s leading benchmark for measuring and reporting corporate sustainability efforts. Currently, the GRI includes 146 indicators drawn from economic, social, and environmental domains, and 33 “aspects” within these domains, such as biodiversity, labor-management relations, and investment and procurement practices.

Many businesses are finding a clear business case for such reporting. Once waste was measured at the 3M Company, for example, it became easier to eliminate. Total emissions of volatile organic compounds dropped from 70,000 tons per year in 1988 to less than 6,000 tons in 2007, and waste elimination overall has saved the company an estimated \$1 billion.

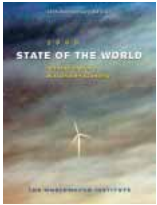
Looking Ahead

Adopting alternative measures of economic advance will require putting political pressure on international, national, and local governments. Nongovernmental organizations (NGOs) are already engaging governments on the issue: in November 2007, for example, NGOs joined the European Commission and the Organisation for Economic Co-operation and Development (OECD) at a conference to clarify the merits of various indices and to explore how to integrate them into decision making.

Governments can use their procurement clout to promote sustainability measures—for example, by insisting that businesses supplying them use GRI reporting. Governments can also help create markets for ecosystem services such as carbon markets and wetland banks, which stimulate landholders to monitor both the stocks of natural capital under their care and the economic value of ecosystem services those stocks generate. And something as simple as a carbon tax would automatically stimulate widespread use of carbon footprint analysis.

Even a requirement that companies disclose the impacts of their activities can have a salutary effect. For example, Superfund legislation in the United States that required companies to disclose the amount of hazardous chemicals within their communities led to the tracking of waste flows, resulting in a 59 percent reduction in the quantity of hazardous chemicals stored on-site.

This brief is based on Chapter 2, “A New Bottom Line for Progress,” by John Talberth, published in the Worldwatch Institute report *State of the World 2008: Innovations for a Sustainable Economy*. To order a copy of *State of the World 2008*, read more briefs in this series, listen to podcasts, and download discussion questions, visit www.worldwatch.org/stateoftheworld.



STATE OF THE WORLD 2008

Rethinking Production

Chapter 3

Key Messages

- Business leaders and policymakers need to rethink the design and production of products and services to offer consumers a higher quality of life while also addressing social and environmental problems.
- Meeting human needs with goods and services that use less energy and fewer materials can be more profitable and deliver a higher standard of living than current practices.
- Production practices that raise resource efficiency, circulate materials, and imitate nature offer a new model of prosperity for today's environmentally degraded and poverty-stricken planet.

The Problem

Modern industrial economies extract raw materials from mines, oil wells, and forests, push them through factories to create finished products for consumers, and send them rapidly to landfills. At all stages of the process, this linear production system is riddled with waste, including pollution to air and water, factory inefficiencies, consumer packaging, and landfills.

From an economic perspective, waste is the inefficient use of resources. This inefficiency is not apparent in the prices of products and services because natural resources are often subsidized or essentially free. When an input is cheap, waste is regarded as costless as well. In contrast, labor and capital—for centuries the most costly inputs to capitalist production—have received the bulk of economic attention.

Today, however, the relative scarcity of inputs has changed. Labor and capital remain costly, but the loss of vital services that ecosystems provide—such as pollination, flood protection, and a stable climate—is increasingly a constraint on economic activity. Shortages of some natural resources, such as copper or lumber, have not yet been of great concern, in part because our voracious economy has become ever-more effective at extracting them. But flows of many other critical resources are now slowing: oil extraction may soon reach its peak, and oceanic fish harvests are constrained not by a lack of boats, but by a scarcity of fish.

Creating sustainable economic activity cannot be achieved unless policymakers and business leaders employ three main strategies: first, use resources far more produc-



Zoë Chafe

Companies are using biomimicry, the conscious emulation of natural systems, to design products based on the forms of natural products and the functions of larger ecosystems. Toyota Motor Co. plans to paint the walls of its Tsutsumi Prius production plant (mocked-up here) with photo-catalytic paint that breaks down NO_x, SO_x, and other airborne pollutants—the same effect as planting 2,000 poplar trees near the plant.

tively; second, redesign products and how they are made; and third, manage all institutions to be restorative of human and natural capital.

Innovations/Solutions

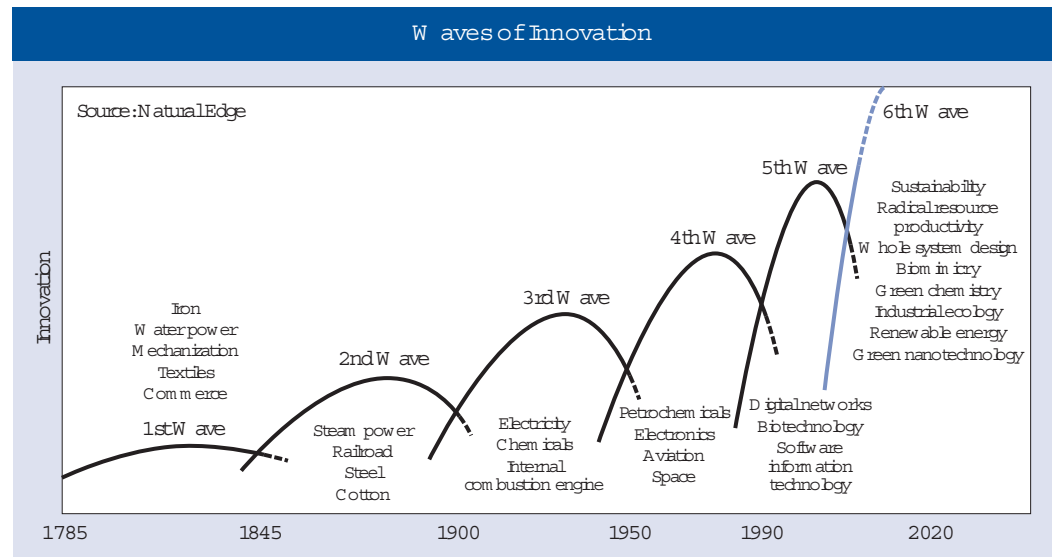
Books such as *Natural Capitalism* and organizations like the World Business Council for Sustainable Development have shown that our use of energy and materials can be increased by a factor of 4 to 10, using new technologies such as efficient LED lighting and practices such as clean production and lean manufacturing. Mastering efficiency saves real money: by 2007, the chemical company DuPont had cut emissions 72 percent below 1991 levels, saving itself \$3 billion in the process.

Designing products and materials to circulate through an economy again and again—the “cradle-to-cradle” approach to product development and use—emerged from a key insight decades ago by Walter Stahel of the Product-Life Institute in Geneva. Stahel wrote that some three-quarters of the energy used in industry is expended in mining or producing basic materials such as steel and cement, and only about 25 percent is used to convert these materials

into finished goods like machines or buildings. Conversely, three times as much labor is used to convert materials into higher value-added products as is used in the original mining. The bottom line: if economic activity were focused on reconditioning or reprocessing old products instead of making new ones, economies would use less energy and create more jobs.

By the time most human products have been designed (but before they have been built), 80 to 90 percent of the economic and ecological costs they will generate over their lifetimes have already become inevitable. The emerging field of biomimicry, however, shows that “doing business as nature does it” can deliver cheaper and superior products with far less environmental impact. Unlike the “heat, beat, and treat” approach of modern industry, nature runs on sunlight, not high flows of fossil energy. It makes very dangerous substances, but nothing like nuclear waste, which remains deadly for millennia. And it creates no waste, using the output of all processes as the input to some other process. Nature shops locally and creates beauty.

Innovative manufacturers are embracing biomimicry. Researchers at Sandia Labs in the United States have mimicked the way abalone build seashells to create, for example, mineral/polymer layers that are optically clear but almost unbreakable—for use as coatings to toughen windshields, airplane bodies, and other products that need to be lightweight but fracture-resistant. And EcoCover Ltd. of New Zealand produces a biodegradable mulch mat that helps gardeners prevent moisture loss and weed growth naturally, as an alternative to plastic landscaping sheeting. These are just two of many companies that have taken bio-



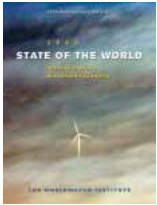
mimicry to heart in design and production processes.

Looking Ahead

Since the first industrial revolution, at least six waves of innovation have emerged, each based on new technologies that underpin economic prosperity. (See Figure.) Today, as in previous eras, older industries will become less competitive unless they join those implementing the array of sustainable technologies and innovative practices that comprise the next wave of innovation.

Companies that implement resource productivity and sustainable production strategies—such as biomimicry and cradle-to-cradle—can improve every aspect of their shareholder value. Increasing shareholder value in this way requires the adoption of an “integrated bottom line” that recognizes the contribution of environmental and social performance, in addition to financial performance, to a company’s worth. Companies that do so are among the most competitive today. In 2007, the investment bank Goldman Sachs released a study showing that companies with strong environmental, social, and governance policies outperformed the stock market in general by 25 percent. And 72 percent of the companies on the list outperformed their industry peers.

This brief is based on Chapter 3, “Rethinking Production,” by Hunter Lovins, published in the Worldwatch Institute report *State of the World 2008: Innovations for a Sustainable Economy*. To order a copy of *State of the World 2008*, read more briefs in this series, listen to podcasts, and download discussion questions, visit www.worldwatch.org/stateoftheworld.



STATE OF THE WORLD 2008

The Challenge of Sustainable Lifestyles

Chapter 4

Key Messages

- Economic growth has delivered ‘islands of prosperity’ to millions of people but has left ‘oceans of poverty’ and unsustainable stresses on the global environment in its wake.
- Relieving this pressure will require technological efficiency gains, population stabilization, and changes to our lifestyles and aspirations.
- All of these are achievable and could lead to widespread improvements in the quality of life.

The Problem

The modern economy has delivered remarkable affluence to hundreds of millions of people worldwide. But the staggering economic growth behind this wealth generation has inflicted dangerous costs on the environment, even as billions more aspire to the same high standard of living.

How can a world of finite resources and increasingly tight environmental constraints support the expectations of 9 billion people (the mid-range population estimate for 2050)? Will they be able to live the lifestyle of the affluent West and the developed nations, especially when much of the Earth’s “environmental space” has been captured by the wealthy through their use of the world’s resources?

Innovations/Solutions

Freeing up environmental space for the poor, by reducing the impacts of economic activity, can be done in three ways:

Improving the efficiency of technology. Great gains have been made in this area in recent years and enormous further gains are possible—in energy especially, but also in manufacturing, city planning and design, and so on. Some experts believe that resource efficiency—the amount of “bang for the buck” from resources invested—can be improved by a factor of 10 or more.

Stabilizing the human population. Every environmental pressure is worsened by rising numbers of people. Hopeful signs can be seen in the many countries that have approached or achieved the “demographic transition,” which yields steady or even declining populations. Nevertheless, the planet’s total population is now approaching 7 billion and is expected to reach 9 billion or so by 2050.

Changing lifestyles. With population set to increase, and even major technological efficiency improvements unable to do the job alone, easing the economic pressure on the global environment will mean adjusting our consumption patterns and changing our lifestyles, especially in the wealthiest nations.

None of this means accepting a lower quality of life. New research over the last 25 years or so has made it increasingly clear that ever-greater consumption is not only a false path to a fulfilling life, it can actually be harmful. Data from around the world suggest that, at lower levels of per capita income, more money can increase life satisfaction. But in countries where per capita income is over \$15,000, there is virtually no connection between the two: more money does not improve life satisfaction. (See Figure.) The same effect can be seen within countries over time. Real per capita income in the United States, for instance, has tripled since 1950, but the percentage of people who say they are very happy has actually declined since the 1970s.

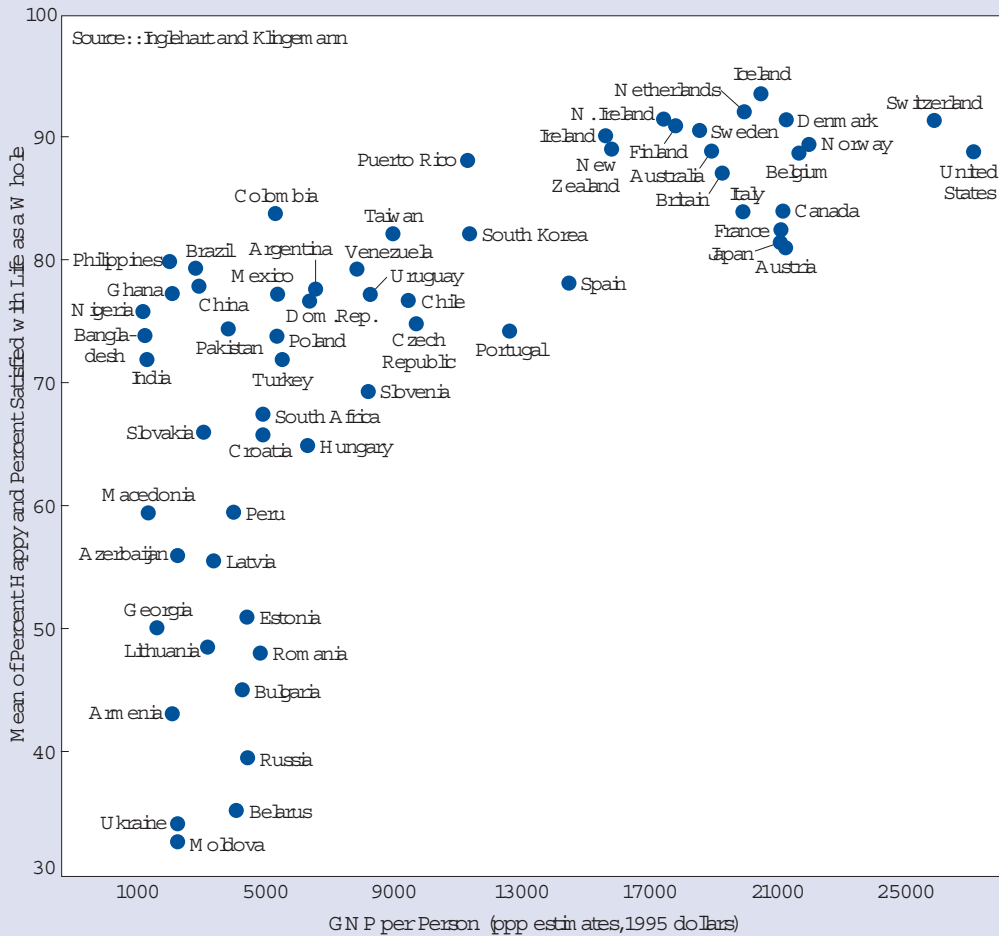
Other evidence—such as the rising rates of obesity and depression—suggests that too much wealth can actually translate into increased *unhappiness*. Highly materialistic people who define themselves through their money and possessions tend to report lower levels of happiness than others. And there appears to be a correlation between rising consumption and the erosion of things that really do make people happy, such as family stability, friendship, trust in others, and strong communities, which are declining in many wealthy countries.



Product policy can have a significant influence on consumers’ access to durable, efficient products that minimize environmental harm. In early 2007, Australia pledged to outlaw incandescent light bulbs before 2010, replacing them with energy-saving alternatives like compact fluorescent lamps (CFLs).

Armistead Booker

Subjective Wellbeing and Per Capita Income, 2000



encourage internalizing the true cost of fossil fuels in market prices. Regulations that support development of durable and efficient products will also help move us toward a sustainable energy regime.

Government policies already play a large role in influencing peoples' values, and that influence can be turned to sustainable ends. One example is government procurement policies: in many countries, government is the largest single purchaser of goods and services and can set production guidelines for these that support sustainability. Governments can also tap the many new indicators of wellbeing, beyond GDP, that better reflect whether policies or business initiatives actually make people better off.

One particularly crucial arena for action lies in advertising, one of the key drivers of the consumerist treadmill. São Paulo, Brazil, the fourth largest city in the world, has banned outdoor advertising. Mindful of the pernicious power of ads aimed at children, including their role in rising childhood obesity, Sweden has banned TV advertising to kids under 12.

The consumer society offers neither a durable sense of meaning in people's lives nor any consolation for losses. Many individuals, communities, and political leaders are beginning to initiate a change, and millions have already discovered that treading more lightly on the Earth allows them to breathe more easily—in more ways than one.

Looking Ahead

To attack these problems and achieve sustainable consumption patterns—that is, living well within certain limits—requires a supportive social environment. All sectors of society can help to create this, but governments are the chief agents for protecting the social good and must take the lead.

Governments must set policy so as to support an infrastructure of sustainability: public transport, recycling, energy efficiency services, and so on. They must establish fiscal and institutional frameworks that send consistent signals to businesses and consumers about sustainable consumption—such as firmly setting a “social cost of carbon” to

This brief is based on Chapter 4, “The Challenge of Sustainable Lifestyles,” by Dr. Tim Jackson, published in the Worldwatch Institute report *State of the World 2008: Innovations for a Sustainable Economy*.

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STATE OF THE WORLD 2008

Meat and Seafood: The Global Diet's Most Costly Ingredients

Chapter 5

Key Messages

- Meat and seafood, two of the most rapidly growing ingredients in the global diet, are also two of the most environmentally costly.
- Fortunately, methods of producing meat and seafood exist today that are more environmentally friendly and better for human health.
- Meat and seafood are likely to be more expensive in the future as consumer demand is balanced against environmental health.

The Problem

In an increasingly populous and prosperous world, demand for meat and seafood has increased dramatically in the last four decades. Consider these data:

- In 2006, farmers produced four times as much chicken, pork, beef, and other meat—some 276 million tons—as in 1961. (See Figure.) On a per-person basis, meat consumption doubled over this period, to 43 kilograms annually.
- The fishing industry harvested eight times as much seafood in 2004—about 141 million tons—as it did in 1950. (See Figure.) This was four times as much on a per-person basis.
- Chinese consumers eat roughly five times as much seafood per person as they did in 1961, while total fish consumption in China has increased more than 10-fold.
- For more than a billion people, mostly in Asia, fish now supply 30 percent of their protein, versus just 6 percent worldwide.

The surge in seafood demand is bumping up against limits of supply. More than two-thirds of ocean fisheries are now fully exploited, as high-tech harvesting methods have helped eliminate 90 percent of the large predatory fish in the ocean. Suppliers have turned increasingly to farmed fish—aquaculture—which now provides 40 percent of all seafood eaten around the world. Seafood production follows the trend of meat production, which for economic reasons occurs increasingly in large-scale operations.

But industrial methods of meat and seafood production have high environmental costs. In 1948, only 7.7 percent of total marine landings were reduced to fishmeal and fish

oil. Today, about 37 percent of global landings are used for feed, eliminating an important historical and future source of human sustenance. Indeed, modern fish farms that raise tuna, salmon, striped bass, shrimp, and other carnivorous species consume considerably more fish in the form of feed than they produce as farmed fish.

The economic advantages that come with industrial meat and fish production often depend on expensive subsidies. Between 1995 and 2005, direct subsidies for livestock totaled \$2.9 billion in the United States alone. Corn and soybean producers, whose output is converted largely to feed for livestock, received some \$50 billion and \$13 billion, respectively, over this period.



Amanda Meares

Studies show that female pigs raised in hoop houses—pens that allow the animals to nest in straw and walk around freely—give birth to more live offspring than those raised in confinement facilities. Group housing, like the pens shown here at the Center for Environment Farming Systems in Goldsboro, North Carolina, can also reduce production costs for pigs by as much as 11 percent.

Governments also subsidize some of the most destructive fishing techniques, such as bottom trawling. Bottom trawlers receive about \$152 million in subsidies annually—about 25 percent of the total value of their catch. For many trawlers, subsidies are the only reason they are able to use this environmentally destructive technique. Ironically, fishing fleets around the world burn more energy in fuel—in 2000, about 12.5 times as much—as they produce in fish.

Innovations/Solutions

Fortunately, producers, retailers, and consumers have developed innovations with the potential to put livestock and seafood on a sustainable track. On the production end, farmers and fishers are rediscovering the value of integrating livestock into a more natural environment. Group housing for sows can reduce production costs by as much as 11 percent compared with gestation crates. And beef cattle raised organically on grass emit 40 percent fewer greenhouse gases and require 85 percent less energy than cattle raised on grain, according to a 2003 Swedish study.

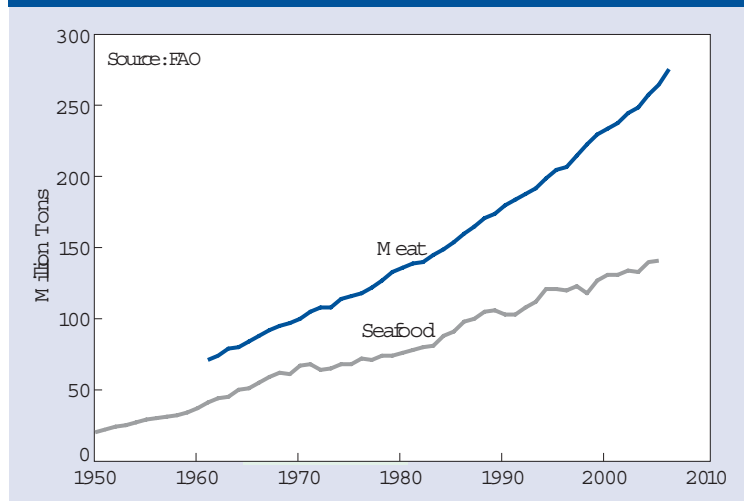
Fish farmers find that they can reduce feed requirements and waste by raising multiple aquatic species together. And scientists in Norway have shown that introducing cleaner-fish into salmon pens dramatically reduces lice and related disease, cuts feed wastage by more than half, and produces two or three additional crops, because the cleaner-fish are harvested for fishmeal.

Some fish farmers are even reclaiming the ancient Chinese practice of producing fish and rice together in paddies. Under this system, fish fertilize the paddies, which in turn provide habitat for the fish; the paddy then provides both rice and fish. Farmers practicing rice-fish culture in Bangladesh have managed to reduce production costs by 10 percent, while increasing farm incomes 16 percent on average.

Retailers and consumers are working to promote sustainable fish and meat production as well. In June 2007, poultry producer Tyson Foods announced that the birds it sells to grocery stores and restaurants in the United States would no longer be treated with antibiotics, following the lead of Smithfield Foods in 2005. Meanwhile, the Marine Stewardship Council, a seafood certification group, applies its blue eco-label to more than 300 seafood products sold in supermarkets in nearly 30 nations, helping consumers choose sustainably produced options.

Finally, governments and international organizations use their clout to shape how fish and meat are produced—starting with subsidy reform. In New Zealand, after the government stopped paying farmers to grow crops and

World Meat Production and Seafood Harvest, 1950–2006



raise animals in 1984, milk production quadrupled. And a study in Norway found that small-scale fisheries generate five times as many jobs per unit of landed value as large-scale ones.

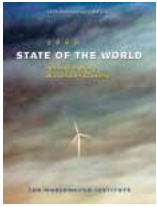
Governments are also active in protecting marine resources. Making just 20 percent of the oceans off-limits to fishing—compared to the roughly 1 percent that is protected today—would be sufficient to create a global system of marine protected areas. Establishing reserves for all the world's major fisheries would cost \$5–19 billion annually and create about 1 million jobs.

Looking Ahead

Redirecting how fish and meat are produced will require rethinking our relationship with these foods. Governments can shape markets for sustainable commerce by removing subsidies and other mechanisms that hide the true ecological costs of meat and fish. Consumers can continue to demand sustainably produced meat and fish. And non-governmental organizations can monitor the sustainability of these products. Corporations and retailers, for their part, have strong incentives to continue to listen to consumer demand.

This brief is based on Chapter 5, “Meat and Seafood: The Global Diet’s Most Costly Ingredients,” by Brian Halweil and Danielle Nierenberg, published in the Worldwatch Institute report *State of the World 2008: Innovations for a Sustainable Economy*.

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STATE OF THE WORLD 2008

Building a Low-Carbon Economy

Chapter 6

Key Messages

- Building a low-carbon economy is the central economic challenge of our age.
- A low-carbon economy requires restructuring the global energy industry through a combination of technological, economic, and policy innovations.
- The historical pattern of economic change, in which politically and economically dominant industries are eventually replaced by startups that become increasingly competitive, is now under way in the energy sector with renewables.

The Problem

Fossil fuels such as coal and oil currently provide 81 percent of the energy that powers the global economy, and their use continues to increase. But fossil fuel dominance will need to end soon if the world's climate is to remain within the range it has occupied for at least 1 million years. To keep climate stable, global carbon emissions will need to peak before 2020 then fall to 40–70 percent of current emissions rates by 2050, eventually settling at less than 20 percent of that rate.

Wealthy industrial countries account for less than 20 percent of the world's population, but they contributed roughly 40 percent of global carbon emissions in 2006. And they are responsible for more than 60 percent of the total carbon dioxide (CO₂) added to the atmosphere from fossil fuel burning since the Industrial Revolution. Meanwhile, carbon emissions are rising rapidly in many developing countries: in China, they are rising 10 times faster than the industrial country average. In 2006, China's fossil fuel emissions were only 12 percent below U.S. levels.

The bottom line: for the world as a whole to halve its emissions by 2050, today's industrial countries will need to cut their emissions by more than 80 percent. Doing this will require eliminating the uncontrolled burning of coal by mid-century.

Innovations/Solutions

Reducing the carbon intensity of modern economies can be done in several ways:

Increasing energy efficiency. Improving the productivity



Subhachandra Chandra

Since the 1970s, many governments have established minimum efficiency standards for home appliances, buildings, and motor vehicles. Europe and Japan currently lead the way, with vehicle efficiency standards of more than 45 miles per gallon expected soon and advances in efficient design, like these Smart Cars in Zurich.

of energy is the cleanest and often the cheapest strategy for meeting rising energy demand. More than half of the energy harnessed today is converted to waste heat, suggesting ample room for efficiency gains. A 2007 study by the McKinsey Global Institute shows that growth in world energy productivity could be profitably increased from 1 percent to 2 percent per year, cutting anticipated demand growth through 2050 by 50 percent. Redesigning cities and buildings for energy efficiency, along with accelerated consumer adoption of green technologies such as compact fluorescent light bulbs (CFLs) and hybrid electric vehicles, are underleveraged strategies for reducing energy demand.

Increasing the use of renewable energy. More than \$100 billion was invested in renewable energy in 2007, according to the latest figures. Biofuels production has grown at 20 percent annually over the last three years. In 2006, corporate R&D on clean energy technologies reached \$9.1 billion, while venture capital and private equity investment in clean energy totaled \$8.6 billion—69 percent above the 2005 level and 10 times the 2001 level.

Other advances. The ability to store energy is increasing rapidly. Wind turbines are being designed to compress air

into steel tubes or underground pockets, which can be released to generate electricity when needed. Longer-lasting batteries are also advancing. And plug-in hybrid cars powered by sunlight, wind power, and biofuels will soon be connected to the grid, feeding in electricity when demand is high. Meanwhile, micro power capacity—small-scale gas turbines, Stirling engines, and fuel cells—can easily generate up to a third of the total electricity supply, with their waste heat available for use in buildings where they are located.

Taken together, renewables could provide many times the current demand for energy. (See Figure.) Consider, for example, that:

- In the United States, solar thermal power plants could provide almost seven times the nation's existing electric capacity.
- Photovoltaic panels on half of suitable U.S. roof area could provide 25 percent of U.S. electricity.
- Solar hot water heaters could meet half the world's water heating needs.
- Offshore wind farms could meet all of the European Union's electricity needs.
- Wind resources in Kansas, North Dakota, and Texas could meet all U.S. electricity needs.

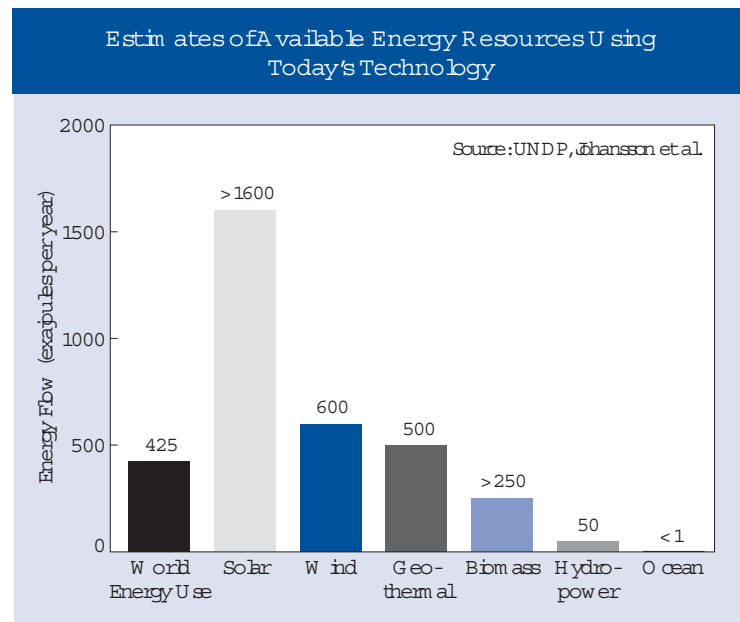
Looking Ahead

Government action can play an important role in steering businesses toward low-carbon solutions. For example:

- Average auto efficiency standards are set to rise to 47 miles per gallon in Japan and 49 miles per gallon in Europe.
- Australia, China, and California plan to phase out most incandescent light bulbs, in favor of CFLs that are four times more efficient.
- In Spain, a recent update of building codes requires all new buildings to incorporate solar water heaters.
- The state government of Baden-Württemberg, Germany, will require that 20 percent of new buildings' heating requirements be met with renewable energy starting in April 2008.

Innovative policy tools are available to open the way for energy efficiency. One important tactic, demonstrated first by California, is to “de-couple” electric utilities’ profits from

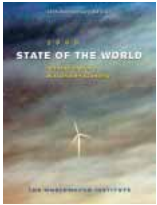
sales, bringing utility companies into the search for efficiency. Another promising idea is to create a “transaction bridge” that allows manufacturers and installers to share in the savings derived from deployment of high-efficiency equipment. Measures that cleverly align incentives toward improving efficiency must be accompanied by the proven tool of government efficiency mandates.



One of the most successful examples of innovative renewables policy is the feed-in tariff introduced by Denmark in the early 1980s and subsequently adopted by Germany and Spain, which gives renewable energy preferred pricing that is phased out gradually as the technology matures. Governments can also greatly increase R&D support: in 2007, U.S. funding for renewables R&D came to little more than \$600 million, about what the government spent in Iraq in a single day.

Finally, renewable energy deployment will be more likely in a market that internalizes carbon costs, by either a carbon tax or a cap-and-trade scheme. In the United States, wind would be competitive with coal if it had to pay the recent European Trading Scheme CO₂ price of \$32 per ton.

This brief is based on Chapter 6, “Building a Low-Carbon Economy,” by Christopher Flavin, published in the Worldwatch Institute report *State of the World 2008: Innovations for a Sustainable Economy*. To order a copy of *State of the World 2008*, read more briefs in this series, listen to podcasts, and download discussion questions, visit www.worldwatch.org/stateoftheworld.



STATE OF THE WORLD 2008

Improving Carbon Markets

Chapter 7

Key Messages

- Carbon is emerging as a key commodity in the 21st century, and carbon markets could become the largest commodity markets in the years ahead.
- While viable carbon markets are now being developed, major challenges still exist, including verification, certification, and monitoring.
- Carbon markets need to be scaled up substantially if they are to play an effective role in combating climate change.

The Problem

The average global temperature is now nearly 0.8 degrees Celsius above pre-industrial levels. To limit additional warming to 2°C, global greenhouse gas (GHG) emissions must peak before 2020 and be reduced by 40 to 70 percent from the current rate by 2050. The need for climate stabilization is as much economic as environmental: a 2006 study by UK economist Nicholas Stern estimated the cost of inaction on climate to be 5 to 20 percent of global economic output.

Acknowledging the need for fast action, the European Union adopted legislation in 2007 committing EU member countries to reduce their collective GHG emissions to 20 percent below 1990 levels by 2020. At the 2007 G8 Summit, Canada, France, Germany, Italy, and Japan called for a 50 percent cut in global emissions by 2050, but Russia and the United States abstained. Achieving these ambitious emissions reduction goals will require widespread adoption of a broad range of policy innovations, including effective carbon markets.

Innovations/Solutions

Carbon markets put a price on emissions of carbon dioxide (CO₂) and other greenhouse gases. When linked to the source of the emissions, such as fossil fuel use, this price raises the cost of emissions-intensive resource use and makes low-carbon alternatives, including renewable energy and energy efficiency improvements, more attractive. Carbon markets also open new channels for investment in carbon-reducing projects. Carbon trading reached an estimated \$30.1 billion in 2006, an increase of nearly 180 percent over the 2005 level. (See Table.)

Within the broad category of carbon credits, there are two distinct segments: allowance-based markets and project-based transactions. Most of this activity occurs globally, though there is accelerating interest in carbon trading at the sub-national and voluntary levels.

Allowance-based markets. These markets dominate today's carbon trade. The European Union's Emissions Trading Scheme (EU-ETS) is by far the largest, accounting for more than 80 percent of the estimated \$30.1 billion in carbon trading in 2006. Initially, the EU-ETS covered 15 countries committed to collectively reducing their emissions 8 percent from 1990 levels by 2012, though newer member states can now also participate. In the 2005–07 test phase, the EU-ETS traded only CO₂ allowances associated with power and heat generation and other selected industries, but in 2008–12, additional sources and gases are likely to be integrated.



Laz'Andre F. Cawagas

The "Clean Development Mechanism" was born out of the Kyoto Protocol, with the goal of allowing industrialized countries to invest in carbon emissions reductions in developing countries. Since 2002, carbon credits worth 920 million tons of CO₂ equivalent have been generated through CDM projects like this wind farm in the Philippines.

Project-based transactions. Examples of this type of carbon trading are the Clean Development Mechanism (CDM) and Joint Implementation (JI), referred to as the Kyoto Protocol's "flexibility mechanisms." Emissions reductions generated by CDM and JI projects can be issued as credits

Carbon Transactions, Selected Markets, 2005 and 2006

Market	2005		2006	
	Volume (mill. tons of CO ₂ equiv.)	Value (million dollars)	Volume (mill. tons of CO ₂ equiv.)	Value (million dollars)
EU Emissions Trading Scheme	321	7,908	1,101	24,357
New South Wales	6	59	20	225
Chicago Climate Exchange	1	3	10	38
Primary Clean Development Mechanism*	351	2,638	475	4,257
Joint Implementation	11	68	16	141
Other compliance	20	187	17	79
Other voluntary markets	6	n/a	13	55
Total	716	10,863[†]	1,652	30,153

* Primary sales of credits generated through the CDM are distinguished from the secondary market, which exists when these credits are resold through a market mechanism such as the EU-ETS. † Excludes over-the-counter voluntary market.

that can count toward investing countries' emissions targets under Kyoto or can be sold into a market like the EU-ETS. In 2006 alone, CDM projects produced certified emissions reductions (CERs) of 475 million tons of CO₂-equivalent, worth more than \$4 billion. JI has yielded relatively modest reductions of 16 million tons of CO₂-equivalent, with corresponding credits valued at \$141 million.

Early on, the CDM was criticized for lax oversight on its rules, but in recent years the Executive Board has exerted greater scrutiny in project approval. Proposed CDM and JI projects must satisfy two key quality-oriented criteria: (1) projects must be certified to be "additional," meaning they would not have taken place if the flexibility mechanism did not exist; and (2) projects must show that their benefits will not be lost due to "leakage"—that is, the emissions will not simply be shifted elsewhere. These criteria help ensure that promised emissions reductions are delivered, but they also contribute to the challenge of high transaction costs (typically 14–22 percent of projected revenues).

Sub-national and voluntary initiatives. Acknowledging the need for rapid action to reduce emissions, states and provinces in Australia and the United States are jumping ahead of their national governments to impose emissions caps and create carbon markets. Currently, the second largest allowance-based market is that of New South Wales, Australia, where the government set mandatory emission reduction targets for the power sector in 2003.

In the United States, 17 states are now moving toward capping GHG emissions and forming regional and inter-regional carbon markets. Ten states have joined the Regional Greenhouse Gas Initiative (RGGI) to cap CO₂ emissions at 1990 levels by 2014 and to reduce them to 10 percent below that by 2018. California has targeted a 25 percent reduction by 2020, and together with five other western states and two Canadian

provinces aims to form a carbon market under the Western Climate Initiative.

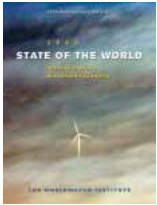
Even without caps on carbon dioxide emissions, businesses, organizations, and individuals are voluntarily purchasing emission reductions, giving purchasers an early understanding of this major new commodity market. At least 23.7 million tons of CO₂-equivalent is estimated to have been traded in voluntary carbon markets in 2006. Of this, nearly 10.3 million tons went through the Chicago Climate Exchange (CCX), which legally binds members to an emissions reduction schedule.

Looking Ahead

Carbon markets are in their infancy, and the strengths and weaknesses of early models offer important lessons. Future incarnations will no doubt benefit from new measurement and certification tools, such as the World Business Council for Sustainable Development/World Resources Institute Greenhouse Gas Protocol and the Climate, Community, and Biodiversity Standards, which were developed by several large companies and environmental groups. In allowance-based markets, some new cap-and-trade schemes are choosing to auction, rather than gift, allowances to avoid windfall corporate profits, such as those associated with the launch of the EU-ETS. And all new carbon markets are struggling with the question of how to effectively incorporate flexibility mechanisms like the CDM.

This brief is based on Chapter 7, "Improving Carbon Markets," by Zoë Chafe and Hilary French, published in the Worldwatch Institute report *State of the World 2008: Innovations for a Sustainable Economy*.

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STATE OF THE WORLD 2008

Water in a Sustainable Economy

Chapter 8

Key Messages

- Looming water shortages and growing recognition of the value of water to the world's economies and ecosystems present new incentives and opportunities for sustainable water management.
- Many innovations—some technological, some policy-oriented, and many market-based—are emerging to help use water more sustainably.
- Water managers and economic policymakers need to collaborate closely in the future because water supply and management is closely intertwined with economic performance.

The Problem

Scarcity of clean water is a looming crisis in a growing number of regions and countries worldwide. Supply pressures are being felt in all major economic sectors, including agriculture, industry, and households, as well as in the environment itself.

Agriculture. Agriculture claims the bulk of water use in most countries, and emerging trends in food production could exacerbate water scarcity. (See Table.) Growing populations and greater demand for livestock-based diets will continue to boost water use. A surge in biofuel production would also increase demand for water on farms. Meanwhile, trade in food and fiber products could ease or aggravate water scarcity, depending on the direction of trade and the products involved.

Industry. In wealthy countries, industry claims twice the share of water that it does in the world as a whole—about 40 percent—while in developing countries, it accounts for only about 10 percent of water usage. Thus, expansion of the industrial sector in emerging economies

will likely spell an increase in water demand.

Households. The household sector claims a small but vital share of global water resources through demand for drinking water and sanitation. More than 1.1 billion people currently lack access to improved water supplies, and more than 2.7 billion lack adequate sanitation. In 2000, at least 1.7 million deaths worldwide were attributed to unsafe water, sanitation, and hygiene practices.

Environment. Societal leaders are under pressure to make room for the environment's claim to water as well. Ecosystems and the myriad species dependent upon them need water. Ecosystems and ecosystem services have value in themselves—and underlie the functioning of economies. Without sustainable management, the environment is first to lose its share of water.

Innovations/Solutions

The pressure to provide adequate supplies of clean water to all sectors of the economy as well as to the environment has given rise to a series of innovations for sustainable water use that move well beyond low-flow faucets, drip irrigation, and many other technologies for wastewater treatment and reuse familiar to most people.

Water managers, for example, are expanding the scope of their work to embrace entire river basins and to take into account the interests of the many stakeholders involved in water management. This broadened perspective leads to new insights, including the value in conserving natural water infrastructure such as wetlands, lakes, and floodplains. These resources are increasingly being used to treat wastewater, control floods, and provide other services—often in lieu of industrial technologies such as water treatment plants. In Costa Rica, for example, a water utility pays landholders to protect forests on the hill slopes from which they derive their water—a policy that benefits landholders, water customers, and nature alike.

Many water management innovations rely on market-based tools. At the most fundamental level, water prices and wastewater fees can be set to reflect water's full value (making allowance for low-income people and ensuring that all have access to minimal levels of affordable water). And targeted pricing schemes use a range of tariff structures and consumer surveys to allocate water resources efficiently,

Water Use by Sector

Region	Agriculture	Industry	Domestic and Residential
		(percent)	
Developing countries	81	11	8
Industrial countries	46	41	13
World	70	20	10

ensure financial viability, and encourage conservation.

Some countries are experimenting with water markets, which allocate water rights that can be bought and sold by users. Others are studying ways to incorporate the value of water use and degradation into calculations of GDP, as with the United Nations' System of Environmental-Economic Accounting for Water.



Pete Mortimer, USDA ARS

Water is as essential to economies as it is to human life. Over the last century, global water use has increased sixfold, at twice the rate of population growth. Technological innovations, such as highly targeted "drip irrigation," shown here, offer ways of managing water more efficiently, productively, and sustainably.

Payments for ecosystem services are increasingly popular and take many forms, including:

- *Private payment schemes*, which provide payments or rewards in return for maintenance or restoration of a watershed service. Mechanisms used in such schemes include transfer payments, land purchase, cost sharing, and the purchase of development rights to land.
- *Cap-and-trade programs*, where a cap is established for the release of pollutants, extraction of groundwater, or

other purposes. Tradable permits or credits are then allocated by dividing up the total available resource among parties interested in using it.

- *Public payment schemes*, which are used to provide safe drinking water or regulate river flows and are the most common form of payment for environmental services. Municipalities or national governments typically spearhead these initiatives and rely on user fees, land purchase, and land easements as management tools.
- *Environmental taxes*, a fiscal mechanism used to ensure that some or all of the external costs of land use are internalized in the decision-making process.

International trade can also be used in service of sustainable water management. If arid countries import water-intensive goods from water-rich regions rather than producing or growing those goods themselves, water savings in the drier countries could be substantial—amounting to 6 percent of the water used in agriculture worldwide, according to recent studies. Trade can also be used to ease water stress by reducing barriers to trade in water-saving technologies and services that can spread state-of-the-art water solutions.

Looking Ahead

Sustainable water management will require that water managers and policymakers work closely together. Water managers need to take into account the economic implications of water management decisions, while economic policymakers will need to be aware of the impact of their policies on water management.

In a sustainable economy, social, economic, and regulatory incentives will need to be aligned to promote water use patterns that are sustainable; water allocations that enhance current and future welfare; and water investments, technologies, and practices that promote efficiency, water quality, conservation, and ecosystem integrity.

This brief is based on Chapter 8, "Water in a Sustainable Economy," by Ger Bergkamp and Claudia W. Sadoff, published in the Worldwatch Institute report *State of the World 2008: Innovations for a Sustainable Economy*.

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STATE OF THE WORLD 2008

Banking on Biodiversity

Chapter 9

Key Messages

- As goods and services provided by nature become more scarce, they will likely become more valuable. As a result, new market opportunities for protecting these resources are emerging.
- Giving economic value to biodiversity and ecosystem services could make these easier to protect by internalizing traditional economic externalities. We are likely to see more market-based approaches to conservation, though the practice raises serious challenges.
- Market approaches are not the entire answer to biodiversity protection. Even in market-based systems, governments must still play a large role in the creation, monitoring, and enforcement of these systems.

The Problem

Nature has long been viewed as providing goods and services for free. Although natural commodities such as minerals, timber, and fish have been priced by markets for decades, environmental services such as clean air, clean water, crop pollination, and flood prevention have been so abundant that they were taken for granted and assigned little economic value. The result has been waste, overuse, and abuse of natural resources.

According to the *Millennium Ecosystem Assessment* (MA), human actions are changing the makeup of life on Earth, mostly for the worse. More than half of the 14 biomes assessed in the MA have experienced a 20–50 percent conversion to human use, leading to habitat loss, invasive species, pollution, population growth, and overexploitation of species. The result has been a documentable loss of biodiversity: some 12 percent of bird species, 23 percent of mammals, and 32 percent of amphibians are now threatened with extinction. (See Figure.)

Innovations/Solutions

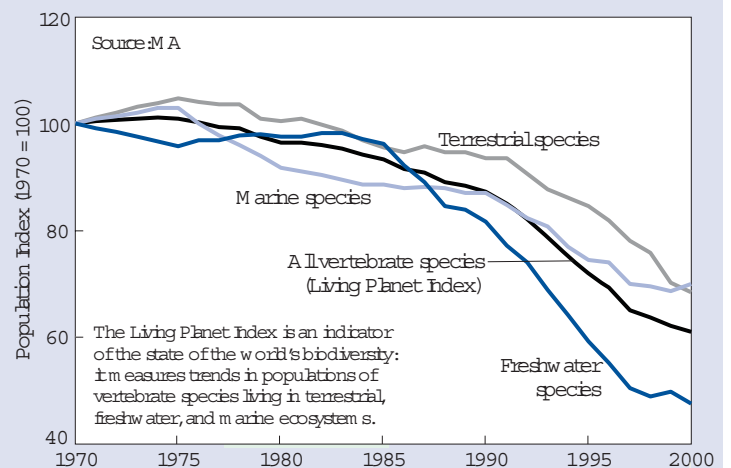
Market mechanisms are increasingly being used to conserve scarce biological resources. For example, some 400 private, for-profit wetland banks operate in a market now worth an estimated \$3 billion per year in the United States. These “mitigation banks” allow developers to build on a wetland as long as they underwrite the protection, creation, or

(more often) restoration of another wetland “of similar value and functions” elsewhere in the same watershed.

Similarly, more than 70 species banks in the United States trade anywhere from \$100 million to \$370 million in species credits each year. This “conservation banking” allows a builder to build on protected habitat if alternative habitat of similar quality is set up elsewhere.

Such market responses turn what had been an economic liability—a piece of land or a species that a landowner was required to protect—into an asset. This alchemy begins

Escalating Biodiversity Loss, 1970–2000



with a law or regulation, like the U.S. Endangered Species Act or the Clean Water Act, that protects biodiversity while creating scarcity. This scarcity in turn creates value: it places a cost on a species or wetland for those who would harm it, and creates a value for those who would conserve it.

Such initiatives raise questions. What does “similar quality” mean when applied to wetlands or habitat, and who makes this judgment? One study of a dozen wetland banks in Ohio found that only three were rated “successful,” four were outright failures, and five had mixed results. Still, the study concluded, wetland banking can be successful if the systems for their regulation are properly designed.

And once an alternative wetland or habitat is established, who ensures that it remains viable indefinitely? Will funding be available to maintain the newly created



Forest in the Jiuzhaigou Valley, Sichuan, China.

wetland? Such concerns lead many to be skeptical of market-based efforts to protect biodiversity. But proponents note that without the banks, the saved wetlands would often have been lost anyway. The reason these systems were created, they argue, is that existing protection of species and ecosystems was failing—that is, when given the option of building a road or protecting a species, many societies go for the roads.

Market approaches grab the headlines today, but government protection of ecosystem services still has an important role to play. In some cases, the government simply requires that biodiversity be conserved: Brazilian law, for example, mandates that landowners keep a minimum amount of territory in forest cover (though enforcement is currently weak). China, meanwhile, uses monetary incentives, paying farmers to keep forest cover on hillsides. And Mexico relies on financial transfers, collecting a fixed amount of revenue from water users and using the funds to protect forested areas in targeted watersheds. Nearly a million hectares of forests are being protected in this way in Mexico.

Costa Rica uses its National Forestry Trust Fund to compensate private landowners who protect their forest cover. Money for the fund comes from a national fuel tax and from the revenue from sales of “environmental credits” to businesses. Between 1996 and 2003, the program enrolled more than 314,000 hectares of forested land, transferring more than \$80 million to landowners in the process.

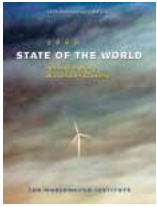
Finally, some businesses are setting up biodiversity offsets on a voluntary basis, as the business case for such action becomes clearer. Companies that participate gain continued access to land and a license to operate,

increase investor confidence and access to capital, bring competitive advantage as a partner, reduce risks and liabilities, and maximize strategic economic opportunities in emerging markets. One initiative to encourage such business action, the Business and Biodiversity Offsets Program, is operating projects in countries as diverse as Ghana, Kenya, Madagascar, Qatar, South Africa, and the United States. Major mining and oil-producing companies are involved in the effort.

Looking Ahead

The future of payments for ecosystem services is uncertain. Biodiversity and conservation banks will need to show that they offer real, ongoing protection to species and habitats. This strengthening may require action from governments, given the key role played by legislation and regulations (such as the U.S. Clean Water Act) in creating biodiversity markets. And because market mechanisms are only a single tool in the conservation toolbox, governments will also need to ensure that old-fashioned legal protections are in place to conserve wildlife and its habitat.

This brief is based on Chapter 9, “Banking on Biodiversity,” by Ricardo Bayon, published in the Worldwatch Institute report *State of the World 2008: Innovations for a Sustainable Economy*. To order a copy of *State of the World 2008*, read more briefs in this series, listen to podcasts, and download discussion questions, visit www.worldwatch.org/stateoftheworld.



STATE OF THE WORLD 2008

Parallel Economy of the Commons

Chapter 10

Key Messages

- An ancient resource-management alternative to the market and the state—“the commons”—is being resurrected as a way to govern increasingly endangered natural resources.
- A commons approach to resource management taps into humanity’s desire to engage in cooperative action.
- Sustainable commons management will require circumscribing corporate power over natural and cultural resources.

The Problem

The planet’s natural resource base—from fisheries and forests to rivers and the atmosphere—is being dangerously overexploited as population grows and prosperity advances. The United Nations reports, for example, that most of the world’s major fishing areas are fished at or beyond capacity, while scientists are increasingly documenting the impacts of rising greenhouse gas emissions on ecosystems, species, and human activities.

Some observers see the “tragedy of the commons” as the problem at the core of natural resource mismanagement. Resources available to all, from local river water to our planet’s atmosphere, are prone to overuse as each user scrambles to avoid being left empty-handed. Given this reality, some critics argue that commons resources should be privatized to promote conservation of them. Others say nationalization of the commons is the answer.

Privatization has been particularly popular in recent years. The North American Free Trade Agreement (NAFTA), for example, declared the water commons a private commodity for purposes of international trade, and helped erode Mexico’s traditional, communally based system of land tenure. Other examples include parceling out broadcast airwaves to corporations, expanding intellectual property laws to allow patenting of seeds and genes, assigning tracts of ocean to corporate fish farmers, and attempting to privatize outer space for advertising.

But citizens can reject privatization and nationalization of commons and still avoid a “tragedy.” The problem with commons management is not common ownership, per se, but rather open access—that is, commons resources for

which there are no social structures or formal rules to govern access and use. Once the capacity of people to organize socially and communicate with one another is factored in (characteristics that are not part of the original 1968 “Tragedy of the Commons” essay by Garrett Hardin), alternatives to privatization and government ownership for protection of natural resources become apparent.

Innovations/Solutions

Efforts to privatize resources have prompted an effort to return to community-based forms of commons management. This ancient solution is still at work around the world. In Bali, Indonesia, rice farmers have coordinated their use of scarce water using “water temples,” an ancient form of water management based on social networks that emphasize cooperative problem-solving. The result is an allocation of water that is close-to-ideal in terms of productivity and pest management. Other examples include the 600-year-old *huerta* system of irrigation management in Spain, the *zanjera* land- and irrigation-management system in the Philippines, and the common pasturing systems found in Switzerland.

These examples show how social structure and social norms are doing jobs—for example, creating and managing resources that are held in common—that conventional economic wisdom says only monetary incentives and private property rights can do. People seek fairness in economic dealings, not just their own gain, according to research studies. They seek stability over the long term, not just quick earnings.

A modern example of management of a cultural commons is Wikipedia, the online encyclopedia written by a broad public and available at no charge on the Internet. It features some 8 million articles, 2 million in English and the remainder in 250 other languages. Wikipedia creator Jimmy Wales took a commons approach to management of intellectual content, seeding a social network rather than tapping conventional economic mechanisms. Wikipedia engages people not as the profit seekers found in conventional economics texts, but as social beings who enjoy producing in this way.

Today, the commons approach to resource management is reappearing in many corners of the economy at large—

from the revival of traditional main streets, public spaces, and community gardens, to the resistance to corporate control of university research and genetic research.

For example, the American Community Gardening Association estimates there are now roughly 18,000 community gardens in the United States, with 750 in New York City alone. In Toronto, Canada, the number increased from 14 to 69 between 1987 and 1997. Meanwhile, the number



John E. Skodak

For centuries, rice farmers in Bali, Indonesia, have coordinated their use of scarce water through social networks built on the innate human capacity to manage resources in a cooperative manner. The result is carefully managed rice terraces that maximize production.

of farmers' markets grew by 150 percent between 1994 and 2006, and now number more than 4,000 in the United States. In Portland, Oregon, the "City Repair" project is turning traffic intersections into public squares. And in Baltimore and Boston, neighbors have closed off back alleys and turned them into commons for their blocks.

One mechanism that can be used to preserve a commons resource is the trust, an institution designed to maintain an asset for future as well as present beneficiaries. An example is the Pacific Forest Trust, which helps protect private forests in the United States from clearcutting and development. It relies on conservation easements, a private-property mechanism used to protect land against activity that would compromise its ecological functions.

Owners keep title to the land and the right to harvest it sustainably, but donate or sell development rights to the trust. Similarly, the Oregon Water Trust acquires the rights to water on private lands while landowners retain title to the land. And the Trust for Public Land in New York City now holds the development rights to 70 community gardens, saving them from efforts to sell the gardens to commercial developers.

Looking Ahead

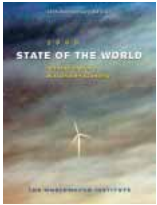
The challenge now is to scale up and replicate trusts, which requires attention to a few key features. The first is equity and mutual benefit. Commons serve all, either equally or by a just distributional standard, subject to necessary rules for access and use. Central Park, for example, is open to all New Yorkers, whether they live in Harlem or in Central Park West, so long as they obey the rules. The second essential feature is a long time horizon. Commons turn the short-run focus of businesses on its head and are designed to preserve assets for the indefinite future. Sometimes governments can help achieve this: Central Park functions well as a commons under public ownership.

Trusts could be scaled up to help manage oceans, the atmosphere, entire watersheds, and other large-scale resources. For example, Peter Barnes of the Tomales Bay Institute has proposed a Sky Trust, which would be legally bound to protect the environmental integrity of the atmosphere in perpetuity. It would limit emissions to the atmosphere to a sustainable level, and charge polluters—typically corporations—for the right to emit. The proceeds from these emissions rights would be used to maintain the resource, with the remainder distributed to the commons owners—all citizens.

Growing interest in commons approaches to resource management suggest that something latent in human nature is breaking through established corporate economy and the bureaucratic state. This new direction is a form of property that is neither the market nor the state, public nor private, but is instead property that people hold jointly and together rather than separately and apart. As governments look for models for conserving natural resources for the long haul, a large part of the answer could lie here.

This brief is based on Chapter 10, "The Parallel Economy of the Commons," by Jonathan Rowe, published in the Worldwatch Institute report *State of the World 2008: Innovations for a Sustainable Economy*.

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STATE OF THE WORLD 2008

Engaging Communities for a Sustainable World

Chapter 11

Key Messages

- Communities are a valuable source of unique assets that can help facilitate the transition to sustainable societies.
- These assets include a community's built infrastructure, the social relationships it generates, the ways of life it promotes, the financial resources at its disposal, and its influence over broader societies.
- Replicating and scaling up innovative community initiatives is key to tapping the full potential of communities to help build sustainable economies.

The Problem

Communities are where people purchase most of their goods, where they are rooted as citizens, and where they cultivate friendships and civic relationships. As such, they are powerful tools for building sustainable economic activity. Yet communities are commonly overlooked in the effort to create policies and incentives for sustainable economies. To disregard communities in the quest for sustainability is to miss out on an important asset needed to help build sustainable economies.

Innovations/Solutions

A growing number of communities are leveraging their unique strengths to jumpstart sustainable economic activity. (See Table.) Communities can play an important role in, for example: modeling sustainability, cultivating community connections, localizing economic production, financing green development, and mobilizing broader societies.

Modeling sustainability. Communities are physical places, and therefore can model sustainable living by designing energy, water, and food systems for lighter environmental impact. Residents of the Findhorn Ecovillage in the United Kingdom, for example, have just half the ecological footprint of an average U.K. resident. And in Germany's Sieben Linden Ecovillage, per capita carbon emissions are just 28 percent of the national average. Meanwhile, suburban residents are finding ways to "green" established developments:

the people of the Phinney Ridge neighborhood in Seattle converted their conventional neighborhood into an ecovillage by organizing residents to reduce their environmental impact, including a global warming project that mobilized neighbors to use push lawn mowers, lower their thermostats, and turn off appliances not in use.

Cultivating community connections. Communities are tapping their "social capital," the relational glue of trust and reciprocity that holds communities together, for sustainability ends. Carpools, community gardens, and potlucks of locally grown food are some of the ways people create strong neighborhood ties centered on sustainability values. The emphasis is to use social bonds to create a high quality of life with lower environmental impacts.

Social capital has measurable value for quality of life. A study in Vermont found that residents of ecovillages and cohousing communities expressed levels of life satisfaction equal to those of the residents of Burlington, where incomes were more than twice as high. The explanation: social capital replaces some expenditures—for example, borrowing a neighbor's power tool substitutes for buying one, or rotational babysitting eliminates the need for paid childcare—and in the process creates a similar quality of life, stronger social ties, and reduced ecological impact.

Social webs for sustainability are also created through "third place" venues outside of home and work, such as cafés and other informal public gathering places. Sustainable third places not only cultivate community ties, but also adopt green business practices and use lectures, discussion groups, informational guides, and other resources

How Selected Communities Model Sustainability

Project	Location	Description
Micro hydroelectric generator	Inverie, Scotland	In 2002, this remote community on the Knoydart peninsula finished refurbishing a 280-kilowatt hydroelectric generator, which now provides electricity for at least 65 properties.
Biomass	ZEGG, Belzig, Germany	The 80 residents of ZEGG obtain their heating from a wood-chip-fired heating plant, with the wood sustainably harvested from the local area.
Rainwater harvesting	Christie Walk, Adelaide, Australia	This 27-unit community captures all on-site rainwater and uses it to maintain its 870 square meters of rooftop and surrounding gardens.

to educate customers about sustainable living.

Localizing economic production.

Localizing economic activity provides more stable jobs, reduces fuel use for shipping, and increases the share of profits that remain within a community. Localizing a community's food sector is increasingly popular, in part because of its clear environmental benefits: locally grown fruits and vegetables in the United States, for example, generate 5 to 17 times less carbon emissions than food from more distant sources. Today, community gardens, farmers' markets, and community-supported agriculture (CSA, where local farmers allow consumers to buy annual subscriptions to farmers' produce) are increasingly used to promote purchases of local food. Some 4,300 farmers' markets and 1,100 CSA farms now operate in the United States.

Beyond the food sector, communities are working to strengthen the exchange of local goods, decentralize business ownership, and provide fair wages. In the United Kingdom, 21 Transition Towns are striving to re-localize, reduce oil dependence, and lower the ecological impact of their economies. And the town of Willits, California, has undertaken assessments of its imported energy and carbon emissions per capita and is now studying how to reduce its dependence on the global economic system.

Financing green development. Mobilizing community capital for investment in local green development is essential if local agriculture, sustainable third places, and other local initiatives are to prosper. Community development financial institutions (CDFIs), such as development banks, credit unions, and loan funds, help to stimulate local initiatives such as affordable housing, jobs that pay a living wage, and essential services such as health care. In the United States, the number of CDFIs quintupled between 1997 and 2005. Other mechanisms used to strengthen local communities include local currencies, time "dollars," and social enterprises (businesses that take on a social challenge as



The Findhorn Community Ecovillage in Scotland contains a cluster of "barrel houses" made from recycled whiskey barrels, among other sustainability-minded features.

well, such as the bakery that hires the chronically unemployed).

Mobilizing broader societies.

Communities can also encourage neighboring communities and municipalities of which they are a part to drive sustainability forward in their region. Some communities have convened local ecological restoration projects, while others have organized courses to educate local residents on how to live more sustainably. Still others are leading broader lobbying efforts to push for sustainable development—some by pushing for "smart growth" planning in their regions, some by lobbying for national legislation that will provide funding for communities to support local businesses and environmental protection projects.

Looking Ahead

The challenge ahead is to replicate and scale-up the many pilot community sustainability efforts already under way. One way that this is happening is by building networks that are designed to share and replicate experiences among communities far from each other.

The Business Alliance for Living Local Economies (BALLE), for example, connects more than 15,000 businesses in 51 networks across 26 U.S. states and Canadian provinces to promote sustainable local commerce. And the Relocalization Network coordinates 166 groups in 13 countries, providing an online learning and networking forum for communities working to lower their reliance on a globalized economic system.

Sometimes scaling initiatives work the other way, as when existing national or international groups develop local initiatives. This is the case with the U.S. Green Building Council, whose successful Leadership in Energy and Environmental Design (LEED) certification program is being adapted for use at the neighborhood level. It will provide a grade for planned neighborhood developments whose designs connect communities, reduce vehicle use, and create local jobs.

This brief is based on Chapter 11, "Engaging Communities for a Sustainable World," by Erik Assadourian, published in the Worldwatch Institute report *State of the World 2008: Innovations for a Sustainable Economy*.

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STATE OF THE WORLD 2008

Mobilizing Human Energy

Chapter 12

Key Messages

- The greatest untapped resource for addressing global poverty and environmental decline is the poor themselves.
- The international community has long focused on financial and technical approaches to development and has more recently emphasized community-based development. But even this approach often fails to genuinely empower people at the grassroots.
- Community-driven development, in contrast, recognizes that the poor must be the authors of their own destiny and that real empowerment requires tackling political and other structural obstacles to grassroots initiative.

The Problem

Despite a century of unprecedented prosperity at the global level, wealth has been slow to spread to many developing countries. Two out of every five human beings today survive on \$2 or less per day. And while GDP per person has grown rapidly in parts of Asia, those achievements may not be environmentally sustainable. By some estimates, China's economic growth is being offset entirely by the cost of pollution and other forms of environmental degradation.

While the international community sets ambitious development targets like the Millennium Development Goals, it can be unclear how to reach them. The debate is often polarized between mobilizing massive financial resources for technical fixes, and piecemeal responses sought by entrepreneurs. Even where efforts at community-based development have been made, these typically have not led to true empowerment of local people.

Community-based development has been deficient on four dimensions:

- *Scope.* Many projects have focused on narrow sectoral outcomes—building a new school, or increasing food production—without considering the more complex development challenges that most communities face.
- *Scale.* Successful projects often are not quickly replicable on a large scale, greatly limiting their impact.
- *Sustainability.* Community-based projects often fail the “walk-away test,” meaning that they collapse after the sponsoring agency pulls out.
- *Structural change.* Many development projects do not

address the structural political challenges, especially lack of local empowerment, that created poverty in the first place.

What is required is to find ways to tap into the ultimate resource—human energy—and to foster empowerment through community-driven (in contrast to merely community-based) development. This sees communities as agents and resources of self-determined change, rather than as locations and targets of projects initiated by governments or non-governmental organizations (NGOs). The challenge now is to find a way for late-developing nations to join the ranks of the prosperous without destroying the natural foundations of their economies.

Innovations/Solutions

Today, thinking in international development policy circles is converging around two important propositions. The first is that no “one-size-fits-all” model of development is available for deployment everywhere—not even the Western models that have generated great wealth over the past century. The second proposition is that poverty is about much more than a lack of income. Lack of access to health and education are important parameters of poverty, in addition to lack of income. In sum, the emerging thinking is that development is about the expansion of freedoms, which requires the interactive engagement of citizens and communities with the state and markets.

So the emphasis is increasingly on community-driven development, which is designed to empower people at the grassroots. One example is an approach called Seed-Scale, which is based on four principles:

- *Build from success, not a needs assessment.* Every community has past successes that can be the basis for inspiration and insight regarding how the community can work together.
- *Engage in partnerships.* Success is more likely when communities work in partnership with state or market actors, and with outside specialists or institutions as change agents.
- *Make decisions based on evidence.* Objective data can inform decisions and help measure progress. Simple survey techniques taught to communities, for example, can give villagers a deeper understanding of their environ-

ment and power over information collection.

- *Measure results through behavior change.* Behavior change happens when people perceive that something works and is in their self-interest to continue.

Once communities are mobilized around their own agendas, scaling up successes to achieve widespread impact is the next challenge. Replication can happen in many ways. An “additive” approach is a village-by-village effort that develops local leaders and change from within the community, but it is typically very slow and dependent on outside resources. A “campaign” approach, often used in



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A private health clinic in Uganda promotes the use of bed nets for malaria prevention.

response to natural disasters, uses large-scale, concentrated efforts aimed at fulfilling a specific need, as for example the global smallpox campaign of the 1970s. However, these approaches are top-down and provide little opportunity for truly engaging communities. A “blueprint” approach applies a technical solution that has worked in a variety of conditions. Examples include nature preserves, appropriate technology projects, large-scale microcredit programs, and infrastructure expansion.

The most innovative replication strategy is the “biological” approach. In an analogy to evolution, it supports local experimentation and adaptation and then sets an enabling environment for rapid expansion and social movement. It combines the local focus of the additive model with the growth potential of the campaign and blueprint approaches, but the impetus comes from within adapting communities.

Seed-Scale envisages expansion at three levels:

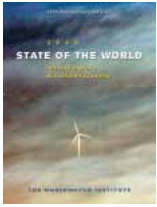
- *The community*, where members master how to build upon their local success, in partnership with NGOs and government agencies. An example is when success in, say, health spreads to success in food security, income generation, education, and other key areas.
- *The region*, where successful communities share their experiences with other communities in the same region. NGOs can facilitate farmer-to-farmer site visits, for example, or knowledge-sharing sessions when farmers come together in market settings.
- *The nation*, as the government works to remove structural obstacles to community-driven development that enable community creativity and energy to blossom.

Looking Ahead

Much can be done to create enabling environments in which community-driven development can thrive. Trade rules could be reformed, for example, to offer greater access by developing-country producers to wealthy-country markets. Aid could drop its “tied” character, under which funds offered for development circle back to the donor country. And donor nations could work more closely with developing-country governments to build capacity needed to administer aid programs effectively. Most importantly, governance needs to be decentralized and citizen-based.

In the end, however, the most important action will happen at the grassroots level, even among the very poorest. Here, empowerment-based approaches hold the most promise, because little more is required than a capacity to aspire.

This brief is based on Chapter 12, “Mobilizing Human Energy,” by Jason S. Calder, published in the Worldwatch Institute report *State of the World 2008: Innovations for a Sustainable Economy*. To order a copy of *State of the World 2008*, read more briefs in this series, listen to podcasts, and download discussion questions, visit www.worldwatch.org/stateoftheworld.



STATE OF THE WORLD 2008

Investing for Sustainability

Chapter 13

Key Messages

- The financial sector is highly influential in determining whether economic activity is sustainable or not.
- A shift toward sustainability investments is well under way, but its continued growth cannot be taken for granted.
- The challenge is to structure investment options so that outcomes promote both sustainability and strong returns.

The Problem

Investment gives long-term shape to any economy, through its underwriting of long-lived projects such as power plants, dams, roads, and other infrastructure. Meanwhile, stock and bond purchases send short-term signals to markets about where to steer investments. Thus, the financial sector is a major force in determining the profile of an economy—and whether it is sustainable or not.

Historically, few incentives have existed to encourage investment managers to steer capital in a sustainable direction. As a result, polluting power plants were the norm, factories produced goods that cannot be recycled or remanufactured, and forests were cut down faster than trees could re-establish themselves. These and many other unsustainable practices still prevail today, and reversing them will be necessary if sustainable economies are to be built this century. Steering finance away from this activity and toward sustainability profit centers is a high-leverage way to create sustainable economies.

Innovations/Solutions

Managers of capital, from venture capitalists to socially responsible investors and microfinanciers, are showing new interest in steering their investments toward sustainable economic activity. One broad measure of this is the rapidly growing adherence to the United Nations' Principles for Responsible Investment, launched in 2006 with 20 mainstream financial institutions. In just one year, the number of signatories had increased ninefold, to 183, and assets under management covered by the agreement grew from \$4 trillion to \$8 trillion.

Rapidly growing interest in investing for sustainability can be attributed, in part, to growing evidence that sustain-

able economic activity is profitable. In 2007, Goldman Sachs reported that leading sustainability companies outperformed the general stock market by 25 percent over the previous two years, and outperformed their same-sector peers by almost 75 percent over that period.

As a result, it has become easier for large institutions and everyday investors alike to consider socially responsible investing (SRI) options, which steer capital away from certain unsustainable activities—say, production of toxics—and toward green alternatives such as renewable energy. SRI is shifting from a niche investment alternative to a more mainstream strategy, with about \$1 of every \$10 invested in the United States using at least one of the three pillars of social investing (screening, shareholder activism, and community investing), according to the Social Investment Forum. Globally, SRI assets now stand at some \$4 trillion.

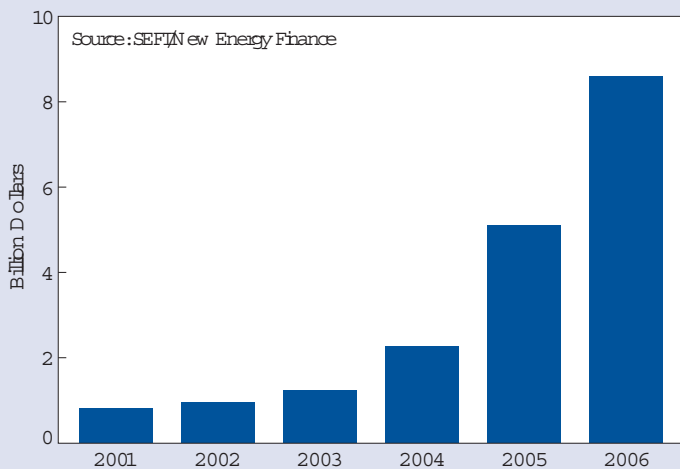
The shareholder activism component of SRI is primarily practiced by filing shareowner resolutions addressing social and environmental issues, which are registering growing levels of support. Of the nearly 180 such resolutions that came to a vote at shareholder meetings through mid-2006, more than a quarter (27 percent) received more than 15



With the assistance of her son, this woman runs a vegetable stand in the main marketplace of Devinuwara, Bangladesh. She has received a microloan from BRAC, a Bangladeshi relief and development organization. She hopes to build a second story and increase her inventory with a second BRAC loan.

Zoë Chafe

Venture Capital and Private Equity Investment in Renewable Energy, 2000–06



percent support from voting shareholders—a level that gets executives’ attention and can lead to corporate change. This performance is almost double the share of resolutions surpassing this threshold in the 2005–06 proxy seasons.

Another rapidly growing area of investment is project finance, the underwriting of major infrastructural projects. In 2003, a set of sustainability guidelines known as the Equator Principles (EPs) was developed to cover project finance, and commitment to the principles has grown rapidly: the EPs are now embraced by 54 signatory banks, representing more than 85 percent of global private project finance worldwide. Although the EPs are criticized for lacking stringency, their rapid embrace suggests that many bankers now see social and environmental health as being among their responsibilities as suppliers of finance.

Venture capital also sees new, profitable opportunities in sustainability investments. According to a June 2007 UN report, global venture capital and private equity investment in sustainable energy increased by 69 percent from 2005 to 2006, reaching \$8.6 billion. (See Figure.) Global capital investment in the “clean-tech” sector, which covers renewable energy, water and sanitation, and sustainable materials, increased by 78 percent in 2006 to \$2.9 billion, making

clean tech the third largest venture-investment category after biotech and information technologies. Today, there are 575 environmental and energy hedge funds, 40-plus hedge funds trading emissions in the United States and Europe, and 13 purely “green” hedge funds.

Even microfinance is growing rapidly. The 100 largest microfinance institutions are increasing their client base by 26 percent annually, and the aggregate international financial institution portfolio for microfinance has increased 150 percent since 2004. Despite the rapid growth, the need continues to be great: only about 4 percent of the overall global demand for microfinance services is being met, according to Microcapital.org.

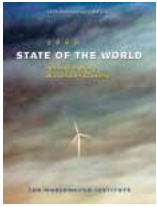
Meanwhile, new microfinance initiatives include Kiva.org, a web-based platform that connects individual lenders directly to borrowers, and Green Microfinance, whose mission is to promote environmentally sustainable microenterprise and microfinance. The granting of the 2006 Nobel Peace Prize to microfinance pioneer Muhammad Yunus raised the profile of this sustainable-investing practice considerably, and practically assures the continued growth of the sector.

Looking Ahead

The 2007 Nobel Peace Prize went to Al Gore, who is devoting most of his time toward using investing as a solution for climate change. Gore was a founding chairman of Generation Investment Management in 2004, the first firm to fully integrate sustainability considerations directly into financial analysis. And after Gore won the Nobel Prize, the venerable Silicon Valley venture capital firm Kleiner Perkins Caufield & Byers appointed him as a Partner in its Greentech investment team, which has invested over \$200 million in greentech startups since 1999.

Late 2007 also saw the launch of five climate change funds from the likes of Virgin Money, HSBC, Schroders, F&C, and Deutsche Bank—which also published a white paper on climate investing. Such mainstream commitment to using investing as a tool for addressing social and environmental challenges suggests that the prospects for continued growth in financing for sustainability are very bright.

This brief is based on Chapter 13, “Investing for Sustainability,” by Bill Baue, published in the Worldwatch Institute report *State of the World 2008: Innovations for a Sustainable Economy*. To order a copy of *State of the World 2008*, read more briefs in this series, listen to podcasts, and download discussion questions, visit www.worldwatch.org/stateoftheworld.



STATE OF THE WORLD 2008

New Approaches to Trade Governance

Chapter 14

Key Messages

- The debate surrounding the global trading system has moved from a narrow focus on policy and mechanisms to a broader interest in how the system might help build sustainable economies.
- As the perception grows that gross inequalities and environmental damage can lead to conflict, the trading system is under pressure to codify trade practices that prevent such conflict.

The Problem

International trade governance suffers from a crisis of legitimacy as the full benefits of trade continue to elude many developing countries. Decades' worth of trade rounds have failed to deliver long-promised prosperity to the poorest nations. The creation of the World Trade Organization (WTO)—whose Preamble declares that trade should advance sustainable development globally—has further highlighted the gap between aspiration and reality.

The latest set of trade negotiations, the Doha Round, was dubbed the “Development Round” in an effort to meet developing-country demands for trade that advances development—by redressing imbalances in the trading system and by providing developing countries with improved market opportunities. Yet more than six years after the launch of Doha, several problems are evident:

- Trade openness on its own does not bring the benefits that trade theory suggests.
- Concerns for equity, the environment, and development are largely incompatible with the traditional hardball approach to trade negotiations and the culture that this approach engenders.
- As the focus of trade policy and trade rules has shifted from border issues to domestic policy, and as the reach of trade has expanded beyond goods, the relationship between trade policy and broader public-policy issues cannot be ignored.
- Developing countries will no longer accept promises of future benefits. They want tangible results from trade negotiations, and even upfront concessions from wealthier trading powers as a sign of good faith.
- Attempts to extend trade policy to cover services, such

as water supply, forestry, and protected area management, have been seen as an effort to privatize what the environmental community regards as public goods.

- Early trade dispute cases decided by GATT appeared to attack the ability of states to harness the power of the market to advance environmental goals.

Moreover, longstanding challenges inherent to trade negotiations complicate efforts to use trade as an engine of development. Negotiated tradeoffs at trade talks, usually undertaken to please domestic constituencies in each country, facilitate trade deals but often do not serve wider goals such as equity, poverty alleviation, or environmental responsibility. In addition, the weight of well-organized commercial interests always trumps less well-organized concerns about equity or the environment.

Innovations/Solutions

The global trade community is showing increasing respect for multilateral environmental agreements and even for the need to use trade measures to ensure compliance. In addition, a major effort is under way to put in place the conditions that would make open borders beneficial to developing countries. In other words, sustainable development has now become a genuine trade imperative.

Since 1997, six intergovernmental agencies, including the WTO, have operated the Integrated Framework (IF) for Trade-Related Technical Assistance for Least Developed Countries. Active in 33 of the world's poorest countries, the IF helps to integrate trade with national development plans and poverty reduction strategies, sets priorities for trade-related technical assistance, and advises government reform to enhance participation in the world economy.

More recently, the WTO has developed a work program on Aid for Trade. Targeting in particular the least-developed countries, this initiative aims to help governments put in place the capacity and institutions needed to benefit from more open trade. Aid for Trade is seen by many developing countries as part of the “down payment” they expect if they are to sign up to any package emerging from the Doha Round.

Efforts are also being made in the Doha negotiations to link a country's obligations to respect certain disciplines with its actual ability to do so. In the ongoing discussions

about trade facilitation (the removal of administrative barriers to trade), countries will agree to take on the full set of obligations only if they have the necessary institutional and human capacity in place. Where they do not, they will receive technical assistance, perhaps through Aid for Trade programs.

Looking Ahead

Beyond the innovations described above, trading nations may need to develop a set of screens and tests to ensure that the impact of new trade rules on sustainable development is positive. A resolution forum in the case of incompatibility would also be needed, probably separate from the formal dispute settlement mechanism, much as the Council for Environmental Cooperation set up under the North American Free Trade Agreement (NAFTA) was intended to do (though it has never lived up to expectations).

Some of the most creative thinking on trade governance is occurring outside traditional institutions. This includes places like the Evian Group, a forum that gathers a mix of WTO delegates and staff, academics, and civil society representatives; the International Centre for Trade and Sustainable Development in Geneva, which offers senior trade officials a safe space in which to experiment; and the Royal Institute for International Affairs in London and its equivalents in Brazil, China, India, and South Africa.

A great deal of experimentation is also under way with forms of collaborative governance that go beyond strict government-to-government interaction. These involve public-private partnerships or public policy partnerships that

gather concerned stakeholders in accountability compacts. The Extractive Industries Transparency Initiative, the World Commission on Dams, and the Forest Stewardship Council are good examples of these.

The goal is to move from an economics framed in terms of efficiency to one framed in terms of justice—a system designed for citizens, not consumers. Future progress will depend on the ability to demonstrate that trade liberalization does indeed advance wider objectives of social justice, human rights, equity, and a healthy environment.

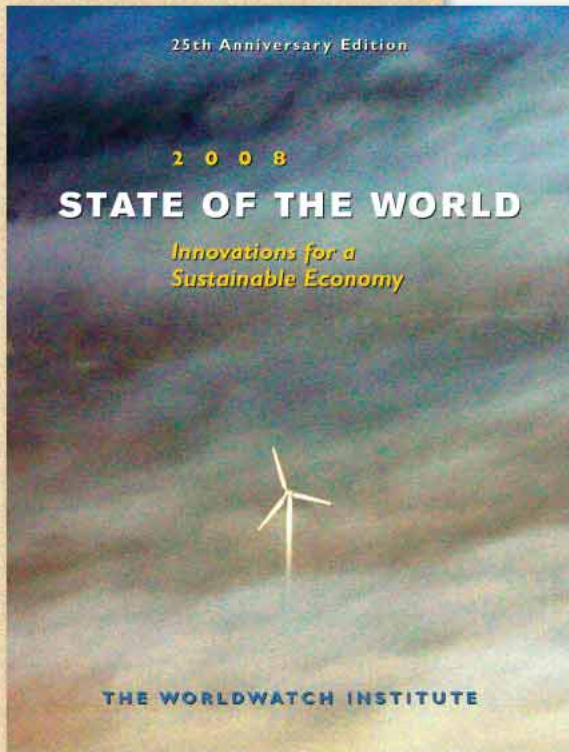


Through consultative processes, the Forest Stewardship Council sets international standards for responsible forest management. Its product label signifies that forest product producers meet FSC standards. Over the past 13 years, over 90 million hectares in more than 70 countries have been certified according to FSC standards.

This brief is based on Chapter 14, “New Approaches to Trade Governance,” by Mark Halle, published in the Worldwatch Institute report *State of the World 2008: Innovations for a Sustainable Economy*. To order a copy of *State of the World 2008*, read more briefs in this series, listen to podcasts, and download discussion questions, visit www.worldwatch.org/stateoftheworld.

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—Daniel C. Esty, Hillhouse Professor of Environmental Law & Policy, Yale University

Table of Contents

Foreword	Improving Carbon Markets
Preface	Water in a Sustainable Economy
A Year in Review Timeline	Banking on Biodiversity
Seeding the Sustainable Economy	The Parallel Economy of the Commons
A New Bottom Line for Progress	Engaging Communities for a Sustainable World
Rethinking Production	Mobilizing Human Energy
The Challenge of Sustainable Lifestyles	Investing for Sustainability
Meat and Seafood: The Global Diet’s Most Costly Ingredients	New Approaches to Trade Governance
Building a Low-Carbon Economy	

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