Great Transition
The Promise and Lure of the Times Ahead

Paul Raskin

Tariq Banuri

Gilberto Gallopín

Pablo Gutman

Al Hammond

Robert Kates

Rob Swart

Great Transition
The Promise and Lure of the Times Ahead

PAUL RASKIN, TARIQ BANURI, GILBERTO GALLOPÍN,
PABLO GUTMAN, AL HAMMOND, ROBERT KATES, ROB SWART

A report of the *Global Scenario Group*

STOCKHOLM ENVIRONMENT INSTITUTE

Global Scenario Group

Cover:
  Stephen S. Bernow
  Devera Ehrenberg

♻ Printed on recycled paper

To our grandparents, who labored and dreamed for us.
To grandchildren the world over, for whom we labor and dream.

Table of Contents

Acknowledgements

We are grateful to each of our *Global Scenario Group* colleagues who joined us over the years in an exhilarating exploration of the global past, present and future—Michael Chadwick, Khaled Mohammed Fahmy, Tibor Farago, Nadezhda Gaponenko, Gordon Goodman, Lailai Li, Roger Kasperson, Sam Moyo, Madiodio Niasse, H.W.O. Okoth-Ogendo, Atiq Rahman, Setijati Sastrapradja, Katsuo Seiki, Nicholas Sonntag and Veerle Vandeweerd. This essay is a manifestation of that joint effort.

We hope the product honors the many wellsprings of collective insight that flowed into it. But any remaining errors of fact, lapses in judgment and failures of imagination are the responsibility of the authors alone.

Preface

"The future is always present, as a promise, a lure and a temptation."

—*Karl Popper*

The global transition has begun—a planetary society will take shape over the coming decades. But its outcome is in question. Current trends set the direction of departure for the journey, not its destination. Depending on how environmental and social conflicts are resolved, global development can branch into dramatically different pathways. On the dark side, it is all too easy to envision a dismal future of impoverished people, cultures and nature. Indeed, to many, this ominous possibility seems the most likely. But it is *not* inevitable. Humanity has the power to foresee, to choose and to act. While it may seem improbable, a transition to a future of enriched lives, human solidarity and a healthy planet is possible.

This is the story elaborated in these pages. It is a work of analysis, imagination and engagement. As analysis, it describes the historic roots, current dynamics and future perils of world development. As imagination, it offers narrative accounts of alternative long-range global scenarios, and considers their implications. As engagement, it aims to advance one of these scenarios—*Great Transition*—by identifying strategies, agents for change and values for a new global agenda.

The essay is the culmination of the work of the *Global Scenario Group*, which was convened in 1995 by the Stockholm Environment Institute as a diverse and international body to examine the requirements for a transition to sustainability. Over the years, the

GSG has contributed major scenario assessments for international organizations, and collaborated with colleagues throughout the world. As the third in a trilogy, *Great Transition* builds on the earlier *Branch Points* (Gallopín et al., 1997), which introduced the *GSG*'s scenario framework, and *Bending the Curve* (Raskin et al., 1998), which analyzed the long-term risks and prospects for sustainability within conventional development futures.

It has been two decades since the notion of "sustainable development" entered the lexicon of international jargon, inspiring countless international meetings and even some action. But it is our conviction that the *first wave* of sustainability activity, in progress since the Earth Summit of 1992, is insufficient to alter alarming global developments. A new wave must begin to transcend the palliatives and reforms that until now may have muted the symptoms of unsustainability, but cannot cure the disease. *A new sustainability paradigm* would challenge both the viability and desirability of conventional values, economic structures and social arrangements. It would offer a positive vision of a civilized form of globalization for the whole human family.

This will happen only if key sectors of world society come to understand the nature and the gravity of the challenge, and seize the opportunity to revise their agendas. Four major agents of change, acting synergistically, could drive a new sustainability paradigm. Three are global actors—intergovernmental organizations, transnational corporations and civil society acting through non-governmental organizations and spiritual communities. The fourth is less tangible, but is the critical underlying element—wide public awareness of the need for change and the spread of values that underscore quality of life, human solidarity and environmental sustainability.

Global change is accelerating and contradictions are deepening. New ways of thinking, acting and being are urgently needed. But as surely as necessity is the spur for a *Great Transition*, the historic opportunity to shape an equitable world of peace, freedom and sustainability is the magnet. This is the promise and lure of the twenty-first century.

1. *Where Are We?*

*E*ach generation understands its historic moment as unique, and its future as rife with novel perils and opportunities. This is as it should be, for history is an unfolding story of change and emergence. Each era is unique—but in unique ways. In our time, the very coordinates through which the historical trajectory moves—time and space—seem transformed. Historical time is accelerating as the pace of technological, environmental and cultural change quickens. Planetary space is shrinking, as the integration of nations and regions into a single Earth system proceeds. Amid the turbulence and uncertainty, many are apprehensive, fearing that humanity will not find a path to a desirable form of global development. But a transition to an inclusive, diverse and ecological planetary society, though it may seem improbable, is still possible.

Historical Transitions

Transitions are ubiquitous in nature. As physical or biological systems develop they tend to evolve gradually within a given state or organization, then enter a period of transformation that is often chaotic and turbulent, and finally emerge in a new state with qualitatively different features. The process of movement from a quasi-stable condition through an interval of rapid change to re-stabilization is illustrated in Figure 1. This broad pattern is found across the spectrum of natural phenomena: the forging of matter in the instant after the big bang, the phase shifts between different states of matter as temperature and pressure change, the epigenesis of individual biological creatures and the evolution of life's diverse forms.

With the emergence of proto-humans some 5 million years ago, and especially *Homo sapiens* about 200,000 years ago, a powerful new factor—cultural development—accelerated the process of change on the planet. Cultural change moves at warp speed relative

Figure 1. Phases of Transition
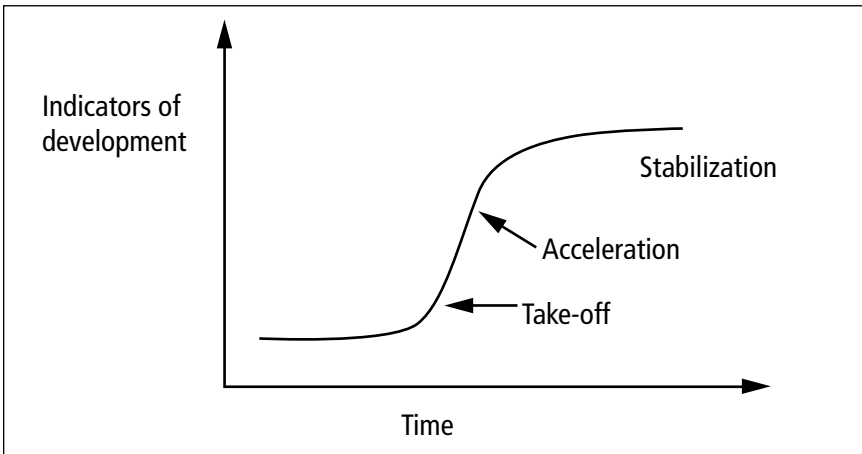
Based on Martens et al. (2001)

to the gradual processes of biological evolution and the still slower processes of geophysical change. A new phenomenon—human history—entered the scene in which innovation and cultural information, the DNA of evolving societies, drove a cumulative and accelerating process of development. With the advent of historical time came a new type of transition, that between the phases of human history that demarcate important transformations in knowledge, technology and the organization of society.

Naturally, the course of history is not neatly organized into idealized transitions. Real history is an intricate and irregular process conditioned by specific local factors, serendipity and volition. The historic record may be organized in different ways, with alternative demarcations between important periods. Yet, a long view of the broad contours of the human experience reveals two sweeping macro-transformations—from Stone Age culture to Early Civilization roughly 10,000 years ago, and from Early Civilization to the Modern Era over the last millennium (Fromkin, 1998). We are now in the midst of a third significant transition, we argue, toward what we shall refer to as the *Planetary Phase of civilization*.

Historical transitions are complex junctures, in which the entire cultural matrix and the relationship of humanity to nature are transformed. At critical thresholds, gradual processes of change working across multiple dimensions—technology, consciousness and institutions—reinforce and amplify. The structure of the socio-ecological system stabilizes in a revised state where new dynamics drive the continuing process of change. But not for all. Change radiates from centers of novelty only gradually through the mechanisms of conquest, emulation and assimilation. Earlier historical eras survive in places that are physically remote and culturally isolated. The world system today overlays an emergent planetary dynamism onto modern, pre-modern and even remnants of Stone Age culture.

Three critical and interacting aspects at each stage are the form of social organization, the character of the economic system, and the capacity for communication. Novel features for each of these dimensions are shown for four historical eras in Table 1.

Table 1. Characteristics of Historical Eras

	Stone Age	Early Civilization	Modern Era	Planetary Phase
Organization	Tribe/village	City-state, kingdom	Nation-state	Global governance
Economy	Hunting and gathering	Settled agriculture	Industrial system	Globalization
Communications	Language	Writing	Printing	Internet

In the Stone Age, social organization was at the tribal and village level, the economy was based on hunting and gathering, and human communication was advanced through the evolution of language. In Early Civilization, political organization moved to the level of the city-state and kingdom, the basis of economic diversification was the surplus generated by settled agriculture, and communication leapt forward with the advent of writing. In the Modern Era, political organization was dominated by the nation-state, the economy became capitalist with the industrial revolution its apotheosis, and

communication was democratized through printing. Extending this typology to the Planetary Phase, emerging political, economic and communications features are, respectively, global governance, globalization of the world economy, and the information revolution.

Numerous additional dimensions could be added to characterize the differences in historical eras, such as changing features of art, science, transportation, values, war and so on. But the schematic of Table 1 at least suggests how various aspects of the socio-economic nexus cohere at different stages in the process of historical evolution. In the transition from one coherent formation to another, each of the dimensions transforms. We can follow this process by looking across the rows of the table. Social organization becomes more extensive—tribal, city-state, nation-state and global governance. The economy becomes more diversified—hunting and gathering, settled agriculture, industrial production and globalization. Communications technology becomes more powerful—language, writing, printing, and the information and communication revolution of the current phase.

Societal complexity—the number of variables needed to describe roles, relationships and connectedness—increases in the course of these transitions. Each phase absorbs and transforms its antecedents, adding social and technological complexity. In a heartbeat of geological time, the scale of organization moves from the tribe to the globe, the economy becomes increasingly differentiated, and the technology of communication develops from the capacity for language to the Internet.

Not only does social complexity and the extent of spatial connectedness increase from one epoch to the next, so does the pace of change. Just as historical transitions occur more rapidly than natural evolutionary transitions, historical transitions are accelerating. This is illustrated in Figure 2, which represents schematically the evolution of complexity of the four major historical phases. Since the time-axis is logarithmic, the repetitive pattern suggests that change is accelerating in a regular fashion. The duration of successive eras decreases by roughly a factor of ten—the Stone Age lasted roughly 100,000 years, Early Civilization about 10,000 years and the Modern Era

Figure 2. Acceleration of History
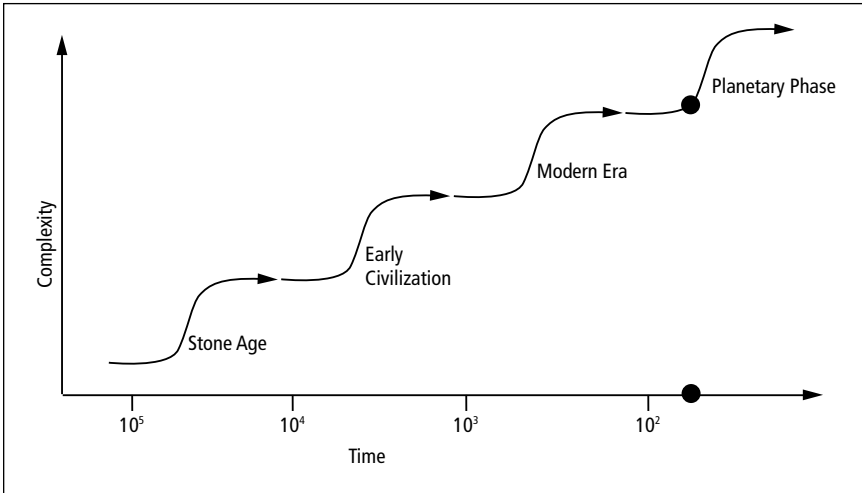
some 1,000 years. Curiously, if the transition to a Planetary Phase takes about 100 years (a reasonable hypothesis, we shall argue) the pattern would continue.

The Planetary Phase

Scanning the broad contours of historical change suggests a long process of increasing social complexity, accelerating change and expanding spatial scale. A premise of much of the contemporary globalization discourse is that humanity is in the midst of a new historical transition with implications no less profound than the emergence of settled agriculture and the industrial system (Harris, 1992). The changing global scene can be viewed through alternative windows of perception—disruption of the planetary environment, economic interdependence, revolution in information technology, increasing hegemony of dominant cultural paradigms and new social and geopolitical fissures.

Globalization is each of these and all of these, and cannot be reduced to any single phenomenon. It is a unitary phenomenon with an array of reinforcing economic, cultural, technological, social and

environmental aspects. At the root of the diverse discourse and debate on globalization, and transcending the differences between those who celebrate it and those who resist it, one theme is common. The hallmark of our time is that the increasing complexity and scale of the human project has reached a planetary scale.

Of course human activity has always transformed the earth system to some extent, and the tentacles of global connectedness reach back to the great migrations out of Africa, to the spread of the great religions, and to the great voyages, colonialism and incipient international markets of a century ago. Capitalism has had periods of rapid expansion and integration of regions on the periphery of world markets. It has also had phases of retraction and stagnation associated with economic, political and military crises. The international system and its institutions have been restructured and dominant nations have been displaced (Sunkel, 2001; Ferrer, 1996; Maddison, 1991). At the end of the nineteenth century, the international integration of finance, trade and investment was comparable to contemporary levels when taken as a percentage of the much smaller world economy.

The claim that a planetary phase of civilization is taking shape does not deny the importance of economic expansion and interdependence in earlier eras. Indeed, the increasing imprint of human activity on nature and the expanding reach of dominant nations were necessary antecedents of globalization. The essence of the premise of a planetary transition is that the transformation of nature and the interconnectedness of human affairs has reached a qualitatively new stage. Growing human population and economies inevitably must butt against the resource limits of a finite planet. The increasing complexity and extent of society over hundreds of millennia must at some point reach the scale of the planet itself. That point is now.

Planetary dynamics operating at global scales increasingly govern and transform the components of the earth system. Global climate change influences local hydrology, ecosystems and weather. Globally connected information and communication technology penetrate to the furthest outposts, changing values and cultures,

while triggering traditionalist backlash. New global governance mechanisms, such as the World Trade Organization (WTO) and international banks, begin to supersede the prerogatives of the nation-state. The stability of the global economy becomes subject to regional financial disruptions. Excluded, marginalized and inundated with images of affluence, the global poor seek immigration and a better global bargain. A complex mix of despair and fundamentalist reaction feeds the globalization of terrorism. All of these are signs that we have entered a new planetary phase of civilization.

These phenomena are the legacy of the Modern Era of the last thousand years, which brought us to the threshold of planetary society. From the first flickering of the humanistic sensibility nearly a thousand years ago, through the intellectual and theological upheaval of the scientific revolution, to the firestorm of capitalist expansion, modernism challenged the authority of received wisdom, the paralysis of birth-right and class rigidity, and the economic stasis of traditionalism. The culmination was the Industrial Revolution of the last two centuries. It fused a host of modern developments—law-governed institutions, market economies and scientific ingenuity—and tapped into the human potential for accumulation, acquisition and innovation. A permanent revolution in technology, culture and desire spawned an explosion of population, production and economic complexity. Ever hungry for new markets, resources and investment opportunities, the self-expanding and colonizing industrial system began its long march toward a world system.

The world has now entered the Planetary Phase, the culmination of the accelerating change and expansion of the Modern Era. A global system is taking shape with fundamental differences from previous phases of history. We would search in vain for a precise moment that demarcates the origin of the new era. The past infuses the present. Surely the growth of world trade a hundred years ago, the two world wars of the twentieth century and the establishment of the United Nations in 1948 were early signals.

But the primary phenomena that constitute globalization emerged as a cluster over the last two decades. Critical developments between 1980 and the present are seen in:

- The global environment. The world becomes aware of climate change, the ozone hole and threats to biodiversity, and holds its first Earth Summit.
- Technology. The personal computer appears at the beginning of the period and the Internet at the end. A manifold communications and information revolution is launched and biotechnology is commercialized for global markets.
- Geo-politics. The USSR collapses, the Cold War ends and a major barrier to a hegemonic world capitalist system is removed. New concerns appear on the geo-political agenda including environmental security, rogue states and global crime and terrorism.
- Economic integration. All markets—commodity, finance, labor and consumer—are increasingly globalized.
- Institutions. New global actors, such as the WTO, transnational corporations and an internationally connected civil society—and global terrorists, the dialectical negation of planetary modernism—become prominent.

Our hypothesis is that these various elements represent constituent aspects of the global transition. This is illustrated in Figure 3, which shows global connectivity, loosely defined, as following the characteristic S-shaped curve of transition, with "take off" over the last two decades. The schematic suggests that we are in the early phase of an accelerating transition. In this turbulent period, the character of the global system that will emerge from the transition cannot be predicted. The ultimate shape of things to come depends to a great extent on human choices yet to be made and actions yet to be taken.

Branch Point

A transition toward a planetary phase of civilization has been launched, but not yet completed. The critical question is: What form will it take? Inspired by the turn of a new millennium, a stream of popular books, pensive editorials and scholarly essays have sought to understand and find meaning in globalization and

Figure 3. Planetary Transition
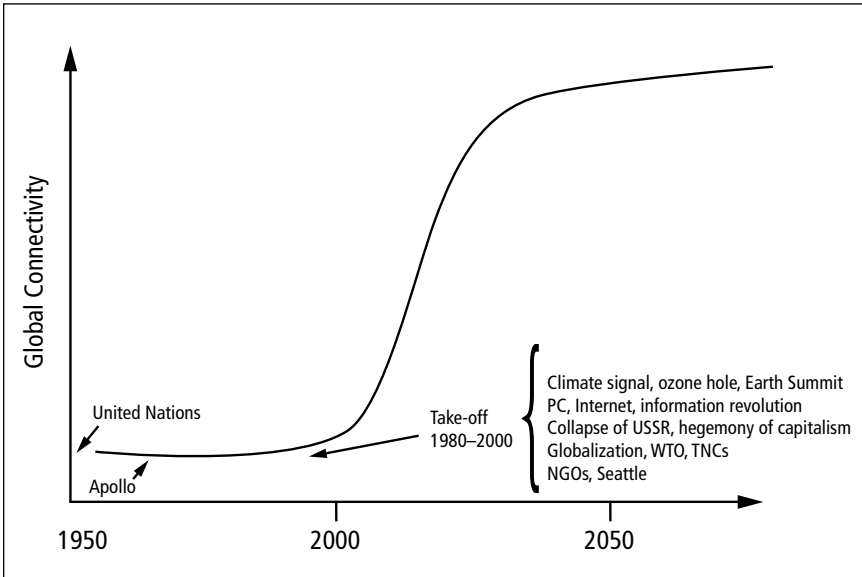
its discontents. The sense that momentous changes are afoot has stimulated a proliferation of explications of what they may portend. As Wittgenstein once noted, the fly in the bottle has difficulty observing the fly in the bottle.

Considerable quantities of old ideological wine have been decanted into the new bottle of global change. As the new realities are refracted through the prism of political and philosophical predilections, the full spectrum of worldviews is revealed—technological optimists and pessimists, market celebrants and Cassandras, social engineers and anarchists. Crudely, archetypal social philosophies can be placed in three broad streams—the evolutionary, the catastrophic and the transformational. They reflect fundamentally different mindsets about how the world works. In the contemporary context, they find expression in divergent outlooks on the long-range prospects for global development.

Evolutionists are optimistic that the dominant patterns we observe today can deliver prosperity, stability and ecological health. Catastrophists fear that deepening social, economic and environmental

tensions will not be resolved, with dire consequences for the world's future. Transformationists share these fears, but believe that global transition can be seized as an opportunity to forge a better civilization. In a sense, these represent three different worlds—a world of incremental adjustment, a world of discontinuous cataclysm and a world of structural shift and renewal.

Each worldview sees the future through cloudy crystal balls of interpretation, fear and hope. And in truth, each has a plausible story to tell, for diverse and contradictory forces are at play that could drive global development toward some form of conventional globalization, barbarism or a great historical transition. Fundamentally different worlds could crystallize from the complex and turbulent state of the planet, depending on unfolding events, serendipity and human choice.

Uncertainty and indeterminacy lie deep in the fabric of reality. At the microscopic scale, subatomic matter undergoes discontinuous quantum leaps between states. At the macroscopic scale, as well, apparently identical complex systems can bifurcate into distinct futures at critical crossroads. Similarly, biological systems can absorb and assimilate external disturbances until critical values are exceeded, and then transition to one of multiple possible states. At critical points, small perturbations can have big effects.

Human reflexivity and volition add further dimensions of indeterminacy. The biography of any individual will include decisive moments when experiences and choices shape the lived life, while other possibilities are filed under "what-could-have-been." Human history, too, is not inevitable, as illustrated by counterfactual histories that re-tell the past with plausible "what ifs?" (Ferguson, 1999)—what if Stalin had been ousted in the 1920s or Germany had won World War II? History is a tree of possibilities, in which critical events and decisions are branch points defining one of many alternative pathways.

The horrific terrorist attacks on the United States of September 11, 2001 and their aftermath provide a vivid real-time example of historical branching. "9/11" was a rip in time that defined a "before" and "after," a cultural short-circuit that revealed deep

global fissures and interrupted complacent attitudes. At one level, it revealed a strain of pan-Islamic fundamentalism that violently rejects the modernist project itself. As a fanatical fight for purity and against any form of assimilation, it cannot be palliated. At the same time, the despair and anger that is the seedbed for extremism has been brought to the world's attention like never before, exposing the contradictions and failures of global development.

Certainly the world will not be the same after 9/11, but the ultimate implications are indeterminate. One possibility is hopeful: new strategic alliances could be a platform for new multinational engagement on a wide range of political, social and environmental problems. Heightened awareness of global inequities and dangers could support a push for a more equitable form of global development as both a moral and a security imperative. Popular values could eventually shift toward a strong desire for participation, cooperation and global understanding. Another possibility is ominous: an escalating spiral of violence and reaction could amplify cultural and political schisms; the new military and security priorities could weaken democratic institutions, civil liberties and economic opportunity; and people could grow more fearful, intolerant and xenophobic as elites withdraw to their fortresses.

In the critical years ahead, if destabilizing social, political and environmental stresses are addressed, the dream of a culturally rich, inclusive and sustainable world civilization becomes plausible. If they are not, the nightmare of an impoverished, mean and destructive future looms. The rapidity of the planetary transition increases the urgency for vision and action lest we cross thresholds that irreversibly reduce options—a climate discontinuity, locking-in to unsustainable technological choices, and the loss of cultural and biological diversity. Postponing the rectification of how we live together on this planet could foreclose the opportunity for a *Great Transition*.

2. Where Are We Headed?

*I*n the past, new historical eras emerged organically and gradually out of the crises and opportunities presented by the dying epoch. In the planetary transition, reacting to historical circumstance is insufficient. With the knowledge that our actions can endanger the well-being of future generations, humanity faces an unprecedented challenge—to anticipate the unfolding crises, envision alternative futures and make appropriate choices. The question of the future, once a matter for dreamers and philosophers, has moved to the center of the development and scientific agendas.

Many Futures

How do scientific forecasters predict the future of a national economy, local weather or other systems? The key steps are description, analysis and modeling—data are gathered on current conditions, factors are identified that drive change, and future behavior is represented as a set of mathematical variables that evolves smoothly over time. This is a powerful approach when the system under study is well understood and the time horizon is limited. But predictive modeling is inadequate for illuminating the long-range future of our stunningly complex planetary system.

Global futures cannot be predicted due to three types of indeterminacy—ignorance, surprise and volition. First, incomplete information on the current state of the system and the forces governing its dynamics leads to a statistical dispersion over possible future states. Second, even if precise information were available, complex systems are known to exhibit turbulent behavior, extreme sensitivity to initial conditions and branching behaviors at critical thresholds—the possibilities for novelty and emergent phenomena render prediction impossible. Finally, the future is unknowable because it is subject to human choices that have not yet been made.

In the face of such indeterminacy, how can we think about the global future in an organized manner? Scenario analysis offers a means of exploring a variety of long-range alternatives. In the theater, a scenario is a summary of a play. Analogously, development scenarios are stories with a logical plot and narrative about how the future might play out. Scenarios include images of the future—snapshots of the major features of interest at various points in time—and an account of the flow of events leading to such future conditions. Global scenarios draw on both science—our understanding of historical patterns, current conditions and physical and social processes—and the imagination to articulate alternative pathways of development and the environment. While we cannot know what will be, we can tell plausible and interesting stories about what could be.

Rather than prediction, the goal of scenarios is to support informed and rational action by providing insight into the scope of the possible. They illuminate the links between issues, the relationship between global and regional development and the role of human actions in shaping the future. Scenarios can provide a broader perspective than model-based analyses, while at the same time making use of various quantitative tools. The qualitative scenario narrative gives voice to important non-quantifiable aspects such as values, behaviors and institutions. Where modeling offers structure, discipline and rigor, narrative offers texture, richness and insight. The art is in the balance.

Global Scenarios

What global futures could emerge from the turbulent changes shaping our world? To organize thinking, we must reduce the immense range of possibilities to a few stylized story lines that represent the main branches. To that end, we consider three classes of scenarios—*Conventional Worlds, Barbarization* and *Great Transitions*. These scenarios are distinguished by, respectively, essential continuity, fundamental but undesirable social change, and fundamental and favorable social transformation.

Conventional Worlds assume the global system in the twenty-first century evolves without major surprise, sharp discontinuity, or

fundamental transformation in the basis of human civilization. The dominant forces and values currently driving globalization shape the future. Incremental market and policy adjustments are able to cope with social, economic and environmental problems as they arise. *Barbarization* foresees the possibilities that these problems are not managed. Instead, they cascade into self-amplifying crises that overwhelm the coping capacity of conventional institutions. Civilization descends into anarchy or tyranny. *Great Transitions*, the focus of this essay, envision profound historical transformations in the fundamental values and organizing principles of society. New values and development paradigms ascend that emphasize the quality of life and material sufficiency, human solidarity and global equity, and affinity with nature and environmental sustainability.

For each of these three scenario classes, we define two variants, for a total of six scenarios. In order to sharpen an important distinction in the contemporary debate, we divide the evolutionary *Conventional Worlds* into *Market Forces* and *Policy Reform*. In *Market Forces*, competitive, open and integrated global markets drive world development. Social and environmental concerns are secondary. By contrast, *Policy Reform* assumes that comprehensive and coordinated government action is initiated for poverty reduction and environmental sustainability. The pessimistic *Barbarization* perspective also is partitioned into two important variants, *Breakdown* and *Fortress World*. In *Breakdown*, conflict and crises spiral out of control and institutions collapse. *Fortress World* features an authoritarian response to the threat of breakdown, as the world divides into a kind of global apartheid with the elite in interconnected, protected enclaves and an impoverished majority outside.

The two *Great Transitions* variants are referred to as *Eco-communalism* and *New Sustainability Paradigm*. *Eco-communalism* is a vision of bio-regionalism, localism, face-to-face democracy and economic autarky. While popular among some environmental and anarchistic subcultures, it is difficult to visualize a plausible path from the globalizing trends of today to *Eco-communalism*, that does not pass through some form of *Barbarization*. In this essay, *Great Transition* is identified with the *New Sustainability Paradigm*,

which would change the character of global civilization rather than retreat into localism. It validates global solidarity, cultural cross-fertilization and economic connectedness while seeking a liberatory, humanistic and ecological transition. The six scenario variants are illustrated in Figure 4, which shows rough sketches of the time behavior of each for selected variables.

The scenarios are distinguished by distinct responses to the social and environmental challenges. *Market Forces* relies on the self-correcting logic of competitive markets. *Policy Reform* depends on government action to seek a sustainable future. In *Fortress World* it falls to the armed forces to impose order, protect the environment and prevent a collapse into *Breakdown. Great Transitions* envision a sustainable and desirable future emerging from new values, a revised model of development and the active engagement of civil society.

Figure 4. Scenario Structure with Illustrative Patterns
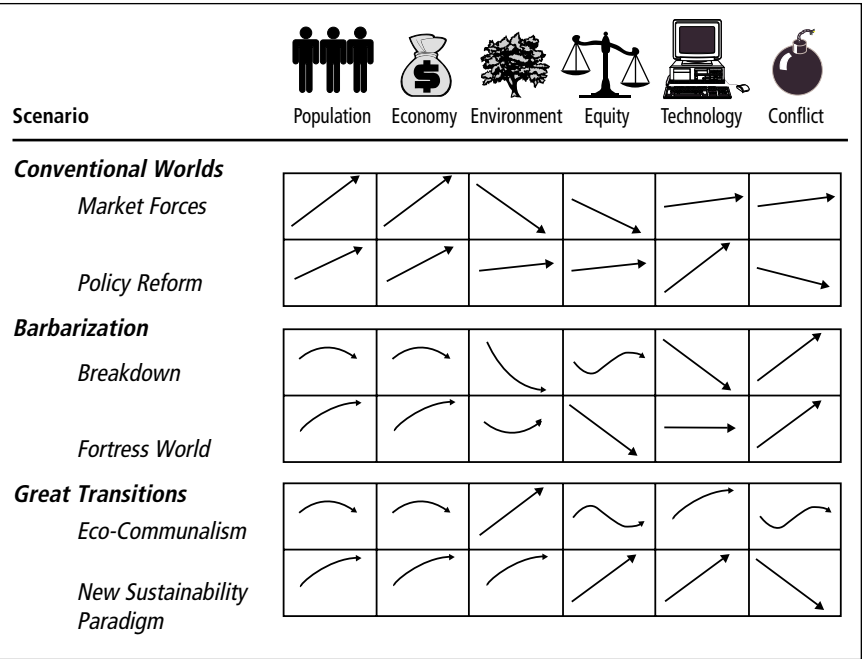
The premises, values and myths that define these social visions are rooted in the history of ideas (Table 2). The *Market Forces* bias is one of market optimism, the faith that the hidden hand of well-functioning markets is the key to resolving social, economic and environmental problems. An important philosophic antecedent is Adam Smith (1776), while contemporary representatives include many neo-classical economists and free market enthusiasts. In *Policy Reform*, the belief is that markets require strong policy guidance to address inherent tendencies toward economic crisis, social conflict and environmental degradation. John Maynard Keynes, influenced by the Great Depression, is an important predecessor of those who hold that it is necessary to manage capitalism in order to temper its crises (Keynes, 1936). With the agenda expanded to include

Table 2. Archetypal Worldviews

Worldview	Antecedents	Philosophy	Motto
Conventional Worlds			
Market	Smith	Market optimism; hidden & enlightened hand	Don't worry, be happy
Policy Reform	Keynes Brundtland	Policy stewardship	Growth, environment, equity through better technology & management
Barbarization			
Breakdown	Malthus	Existential gloom; population/resource catastrophe	The end is coming
Fortress World	Hobbes	Social chaos; nasty nature of man	Order through strong leaders
Great Transitions *Eco-communalism*	Morris & social utopians Ghandhi	Pastoral romance; human goodness; evil of industrialism	Small is beautiful
New Sustainability Paradigm	Mill	Sustainability as progressive global social evolution	Human solidarity, new values, the art of living
Muddling Through	Your brother-in-law (probably)	No grand philosophies	Que será, será

environmental sustainability and poverty reduction, this is the perspective that underlay the seminal Brundtland Commission report (WCED, 1987) and much of the official discourse since on environment and development.

The dark belief underlying the *Breakdown* variant is that the world faces an unprecedented calamity in which unbridled population and economic growth leads to ecological collapse, rampaging conflict and institutional disintegration. Thomas Malthus (1798), who projected that geometrically increasing population growth would outstrip arithmetically increasing food production, is an influential forerunner of this grim prognosis. Variations on this worldview surface repeatedly in contemporary assessments of the global predicament (Ehrlich, 1968; Meadows et al., 1972; Kaplan, 2000). The *Fortress World* mindset was foreshadowed by the philosophy of Thomas Hobbes (1651), who held a pessimistic view of the nature of man and saw the need for powerful leadership. While it is rare to find modern Hobbesians, many people in their resignation and anguish believe that some kind of a *Fortress World* is the logical outcome of the unattended social polarization and environmental degradation they observe.

The forebears of the *Eco-communalism* belief system lie with the pastoral reaction to industrialization of William Morris and the nineteenth-century social utopians (Thompson, 1993); the small-is-beautiful philosophy of Schumacher (1972); and the traditionalism of Gandhi (1993). This anarchistic vision animates many environmentalists and social visionaries today (Sales 2000; Bossel 1998). The worldview of *New Sustainability Paradigm* has few historical precedents, although John Stuart Mill, the nineteenth century political economist, was prescient in theorizing a post-industrial and post-scarcity social arrangement based on human development rather than material acquisition (Mill, 1848). Indeed, the explication of the new paradigm is the aim of the present treatise.

Another worldview—or more appropriately anti-worldview— is not captured by this typology. Many people, if not most, abjure speculation, subscribing instead to a *Muddling Through* bias, the last row of Table 2 (Lindblom, 1959). This is a diverse coterie,

including the unaware, the unconcerned and the unconvinced. They are the passive majority on the grand question of the global future.

Driving Forces

While the global trajectory may branch in very different directions, the point of departure for all scenarios is a set of driving forces and trends that currently condition and change the system:

Demographics

Populations are growing larger, more crowded and older. In typical projections, global population increases by about 50 percent by 2050, with most of the additional three billion people in developing countries. If urbanization trends continue, there will be nearly four billion new city dwellers, posing great challenges for infrastructure development, the environment and social cohesion. Lower fertility rates will lead gradually to an increase in average age and an increase in the pressure on productive populations to support the elderly. A *Great Transition* would accelerate population stabilization, moderate urbanization rates and seek more sustainable settlement patterns.

Economics

Product, financial and labor markets are becoming increasingly integrated and interconnected in a global economy. Advances in information technology and international agreements to liberalize trade have catalyzed the process of globalization. Huge transnational enterprises more and more dominate a planetary marketplace, posing challenges to the traditional prerogatives of the nation-state. Governments face greater difficulty forecasting or controlling financial and economic disruptions as they ripple through an interdependent world economy. This is seen directly in the knock-on effects of regional financial crises, but also indirectly in the impacts of terrorist attacks and health scares, such as mad cow disease in Europe. In a *Great Transition*, social and environmental concerns would be reflected in market-constraining policies, a vigilant civil society would foster more responsible corporate behavior and new values would change consumption and production patterns.

Social Issues

Increasing inequality and persistent poverty characterize the contemporary global scene. As the world grows more affluent for some, life becomes more desperate for those left behind by global economic growth. Economic inequality among nations and within many nations is growing. At the same time, the transition to market-driven development erodes traditional support systems and norms, leading to considerable social dislocation and scope for criminal activity. In some regions, infectious disease and drug-related criminal activity are important social factors affecting development. A central theme of a *Great Transition* is to make good on the commitments in the 1948 Universal Declaration on Human Rights to justice and a decent standard of living for all, in the context of a plural and equitable global development model.

Culture

Globalization, information technology and electronic media foster consumer culture in many societies. This process is both a result and a driver of economic globalization. Ironically, the advance toward a unified global marketplace also triggers nationalist and religious reaction. In their own ways, both globalization, which leaves important decisions affecting the environment and social issues to transnational market actors, and religious fundamentalist reaction to globalization pose challenges to democratic institutions (Barber, 1995). The 9/11 attacks on the United States left no doubt that global terrorism has emerged as a significant driving force in world development. It appears to have contradictory causes—too much modernism and too little. Its hardcore militants seem energized by utopian dreams of a pan-Islamic rejection of Western-oriented global culture. Its mass sympathy seems rooted in the anger and despair of exclusion from opportunity and prosperity. In the clamor for consumerism or its negation, it is sometimes difficult to hear the voices for global solidarity, tolerance and diversity. Yet, they are the harbinger of the ethos that lies at the heart of a *Great Transition*.

Technology
Technology continues to transform the structure of production, the nature of work and the use of leisure time. The continued advance of computer and information technology is at the forefront of the current wave of technological innovation. Also, biotechnology could significantly affect agricultural practices, pharmaceuticals and disease prevention, while raising a host of ethical and environmental issues. Advances in miniaturized technologies could revolutionize medical practices, material science, computer performance and many other applications. A *Great Transition* would shape technological development to promote human fulfillment and environmental sustainability.

Environment
Global environmental degradation is another significant transnational driving force. International concern has grown about human impacts on the atmosphere, land and water resources, the bioaccumulation of toxic substances, species loss and the degradation of ecosystems. The realization that individual countries cannot insulate themselves from global environmental impacts is changing the basis of geo-politics and global governance. A core element of a new sustainability paradigm would be the understanding of humanity as part of the web of life with responsibility for the sustainability of nature.

Governance
There is a significant trend toward democratization and decentralization of authority. On an individual level, there is increased emphasis on "rights," such as women's rights, indigenous rights and human rights broadly conceived. In the private sector, it is reflected in "flatter" corporate structures and decentralized decision-making. Some entities, such as the Internet or NGO networks, have no formal authority structure. The emergence of civil society as an important voice in decision-making is a notable development. A *Great Transition* would see the emergence of a nested governance structure from the local to the global that balances the need to sustain global

social and environmental values with the desire for diversity in cultures and strategies.

Market-driven Development and its Perils

In the *Market Forces* scenario, dominant forces and trends continue to shape the character of global development in the coming decades. The tendencies supporting a sustainability transition remain secondary forces. This is the tacit assumption of "business-as-usual" scenarios. But it should be underscored that, like all scenarios, *Market Forces* is a normative vision of the future. Its success requires policy activism, and it will not be easy. Comprehensive initiatives will be required to overcome market barriers, create enabling institutional frameworks and integrate the developing world into the global economic system. This is the program of the IMF, WTO and the so-called "Washington consensus"—we call it the conventional development paradigm.

An earlier study analyzed the *Market Forces* scenario in depth for each global region (Raskin et al., 1998). A thumbnail sketch of selected global indicators is shown in Figure 5. The use of energy, water and other natural resources grows far less rapidly than GDP. This "dematerialization" is due both to structural shifts in the economy—from industry to the less resource-intensive service sector—and to market-induced technological change. But despite such reductions, the pressures on resources and the environment increase as the growth in human activity overwhelms the improved efficiency per unit of activity. The "growth effect" outpaces the "efficiency effect."

Among the projections in the *Market Forces* scenario:
- Between 1995 and 2050, world population increases by more than 50 percent, average income grows over 2.5 times and economic output more than quadruples.
- Food requirements almost double, driven by growth in population and income.
- Nearly a billion people remain hungry as growing populations and continuing inequity in the sharing of wealth counterbalance the poverty-reducing effects of general economic growth.

Figure 5. Global Indicators in *Market Forces* Scenario
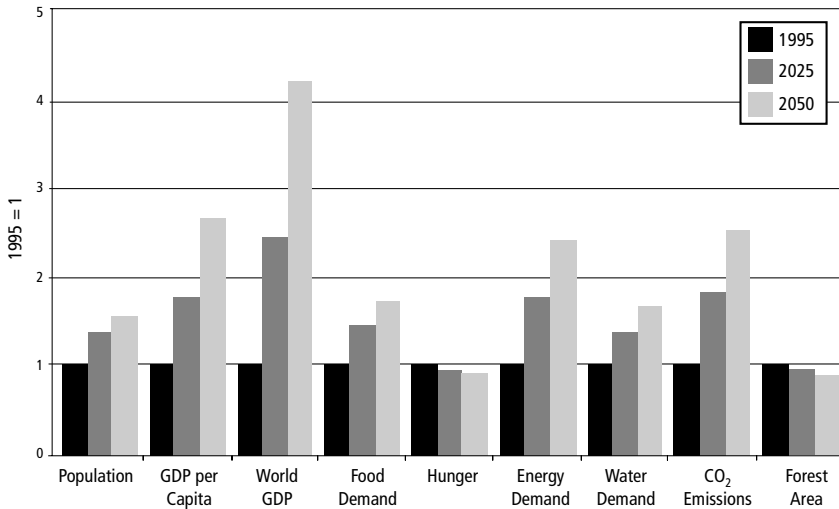
- Developing region economies grow more rapidly than the average, but the absolute difference in incomes between industrialized and other countries increases from an average of about $20,000 per capita now to $55,000 in 2050, as incomes soar in rich countries.
- Requirements for energy and water increase substantially.
- Carbon dioxide emissions continue to grow rapidly, further undermining global climate stability, and risking serious ecological, economic and human health impacts.
- Forests are lost to the expansion of agriculture and human settlement areas and other land-use changes.

A *Market Forces* future would be a risky bequest to our twenty-first century descendants. Such a scenario is not likely to be either sustainable or desirable. Significant environmental and social obstacles lie along this path of development. The combined effects of growth in the number of people, the scale of the economy and the throughput of natural resources increase the pressure that human activity imposes on the environment. Rather than abating, the unsustainable process of environmental degradation that we observe

in today's world would intensify. The danger of crossing critical thresholds in global systems would increase, triggering events that could radically transform the planet's climate and ecosystems.

The increasing pressure on natural resources is likely to cause disruption and conflict. Oil would become progressively scarcer in the next few decades, prices would rise and the geopolitics of oil would return as a major theme in international affairs. In many places, rising water demands would generate discord over the allocation of scarce fresh water both within and between countries—and between human uses and ecosystem needs. To feed a richer and larger population, forests and wetlands would continue to be converted to agriculture, and chemical pollution from unsustainable agro-industrial farming practices would pollute rivers and aquifers. Substantial expansion of built-up areas would contribute significantly to land cover changes. The expansion of irrigated farming would be constrained sharply by water shortage and lack of suitable sites. Precious ecosystems—coastal reefs, wetlands, forests and numerous others—would continue to degrade as a result of land change, water degradation and pollution. Increasing climate change is a wild card that could further complicate the provision of adequate water and food, and the preservation of ecosystem goods, services and amenities.

The social and economic stability of a *Market Forces* world would be compromised. A combination of factors—persistence of global poverty, continued inequity among and within nations and degradation of environmental resources—would undermine social cohesion, stimulate migration and weaken international security. *Market Forces* is a precarious basis for a transition to an environmentally sustainable future. It may also be an inconsistent one. The economic costs and social dislocation of increasing environmental impacts could undermine a fundamental premise of the scenario—perpetual global economic growth.

Fraught with such tensions and contradictions, the long-term stability of a *Market Forces* world is certainly not guaranteed. It could persist for many decades, reeling from one environmental, social and security crisis to the next. Perhaps its very instability

would spawn powerful and progressive initiatives for a more sustainable and just development vision. But it is also possible that its crises would reinforce, amplify and spiral out of control.

Barbarization and the Abyss

Barbarization scenarios explore the alarming possibility that a *Market Forces* future veers toward a world of conflict in which the moral underpinnings of civilization erode. Such grim scenarios are plausible. For those who are pessimistic about the current drift of world development, they are probable. We explore them to be forewarned, to identify early warning signs and to motivate efforts that counteract the conditions that could initiate them.

The initial driving forces propelling this scenario are the same as for all scenarios. But the momentum for sustainability and a revised development agenda, which seemed so compelling at the close of the twentieth century, collapses. The warning bells—environmental degradation, climate change, social polarization and terrorism—are rung, but not heeded. The conventional paradigm gains ascendancy as the world enters the era of *Market Forces*. But instead of rectifying today's environmental and socio-economic tensions, a multi-dimensional crisis ensues.

As the crisis unfolds, a key uncertainty is the reaction of the remaining powerful institutions—country alliances, transnational corporations, international organizations, armed forces. In the *Breakdown* variant, their response is fragmented as conflict and rivalry amongst them overwhelm all efforts to impose order. In *Fortress World*, powerful regional and international actors comprehend the perilous forces leading to *Breakdown*. They are able to muster a sufficiently organized response to protect their own interests and to create lasting alliances. The forces of order view this as a necessary intervention to prevent the corrosive erosion of wealth, resources and governance systems. The elite retreat to protected enclaves, mostly in historically rich nations, but in favored enclaves in poor nations, as well. A *Fortress World* story is summarized in the box below.

The stability of the *Fortress World* depends on the organizational capacity of the privileged enclaves to maintain control over

the disenfranchised. The scenario may contain the seeds of its own destruction, although it could last for decades. A general uprising of the excluded population could overturn the system, especially if rivalry opens fissures in the common front of the dominant strata. The collapse of the *Fortress World* might lead to a *Breakdown* trajectory or to the emergence of a new, more equitable world order.

Fortress World: A Narrative

By 2002, the market euphoria of the last decade of the twentieth-century seems like a naïve and giddy dream. A global economic recession chastens the irrational exuberance of dot-com investors, and the 9/11 terrorist attack awakens a sleepwalking global elite to deep fissures cutting across the geo-political landscape. The nations of the world, mobilized in a cooperative effort to fight terrorism, are offered an unexpected opportunity to redirect development strategy and commit to a form of globalization that is more inclusive, democratic and sustainable. But they do not seize it. The moment of unity and possibility is squandered, in a frenzy of militarism, suspicion and polarization. The empty rhetoric of Earth Summit 2002 is an obituary for the lost era of sustainable development.

Gradually, a coordinated campaign is able to control terrorism at "manageable" levels, although episodic attacks periodically invigorate the politics of fear. The mantra of economic growth, trade liberalization and structural adjustment continues to be heard in the halls of global governance organizations, such as the WTO, the boardrooms of transnational corporations and corridors of national governments. The old ideology of individualism and consumerism flourishes anew, but with a greater respect for the legitimacy of government—as the guarantor of national and individual security, in the first instance, and as an activist partner in enforcing a global market regime, in general.

But it is a bifurcated form of economic globalization limited largely to the so-called "20/20 club"—the 20 percent of nations that are rich and the 20 percent of the elite in nations that are not. The global economy spawns a new class of internationally connected affluent. But there is a counterpoint—the billions of desperately poor whose boats fail to rise with the general economic tide. Some international agencies and some governments continue to mount programs aimed at reducing poverty, promoting entrepreneurship and modernizing institutions. But with financial and political priorities oriented toward security and control, the efforts are woefully inadequate.

As the level of poverty increases and the gulf between rich and poor widens, development aid continues to decline. The remnants of the institutional capacity and moral commitment to global welfare are lost. Meanwhile, environmental conditions deteriorate. Multiple stresses—pollution, climate change, ecosystem degradation—interact and amplify the crisis. Disputes over scarce water resources feed conflict in regions with shared river basins. Environmental degradation, food insecurity and emergent diseases foster a vast health crisis.

Fortress World: A Narrative

Tantalized by media images of opulence and dreams of affluence, the excluded billions grow restive. Many seek emigration to affluent centers by any means necessary. Criminal activity thrives in the anarchic conditions, with some powerful global syndicates able to field fearsome fighting units in their battle against international policing activities. A new kind of militant—educated, excluded and angry—fans the flames of discontent. The poison of social polarization deepens. Terrorism resurges, escalating from waves of suicide attacks at popular gatherings and on symbols of globalism, to use of biological and nuclear weapons.

In this atmosphere of deepening social and environmental crisis, conflict feeds off old ethnic, religious and nationalist tensions. Poor countries begin to fragment as civil order collapses and various forms of criminal anarchy fill the vacuum. Even some of the more prosperous nations feel the sting as infrastructure decays and technology fails. The global economy sputters and international institutions weaken, while the bite of climate change and environmental devastation grows fiercer. The affluent minority fears it too will be engulfed by rampant migration, violence and disease. The global crisis spins out of control.

The forces of global order take action. International military, corporate, and governance bodies, supported by the most powerful national governments, form the self-styled Alliance for Global Salvation. Using a revamped United Nations as their platform, a state of planetary emergency is declared. A campaign of overwhelming force, rough justice and draconian police measures sweeps through hot spots of conflict and discontent. With as-needed military and reconstruction support from the Alliance, local forces nearly everywhere are able to subdue resistance and impose stability backed by international peacekeeping units.

A system of global dualism—some call it a *Fortress World,* others Planetary Apartheid—emerges from the crisis. The separate spheres of the haves and have-nots, the included and excluded, are codified in asymmetrical and authoritarian legal and institutional frameworks. The affluent live in protected enclaves in rich nations and in strongholds in poor nations—bubbles of privilege amidst oceans of misery. In the police state outside the fortress, the majority is mired in poverty and denied basic freedoms. The authorities use high-tech surveillance and old-fashioned brutality to control social unrest and migration, and to protect valued environmental resources. The elite have halted barbarism at their gates and enforced a kind of environmental management and uneasy stability.

On Utopianism and Pragmatism

The *Market Forces* worldview embraces both an ambitious vision and a cosmic gamble. The vision is to forge a globally integrated free market by eliminating trade barriers, building market-enabling institutions and spreading the Western model of development. The colossal gamble is that the global market will not succumb to its internal contradictions—planetary environmental degradation, economic instability, social polarization and cultural conflict.

As environments degrade, it is true that some automatic correction acts through the subtle guidance of the "hidden hand" of the market. Environmental scarcity will be reflected in higher prices that reduce demand, and in business opportunities that promote technological innovation and resource substitution. This is why environmental economics draws attention to the critical importance of "internalizing the externalities"—ensuring that the costs of the degradation of environmental resources are monetarized and borne by the producers and consumers who impose such costs. Will such self-correcting mechanisms provide adjustments of sufficient rapidity and scale? To believe so is a matter of faith and optimism with little foundation in scientific analysis or historical experience. There is simply no insurance that the *Market Forces* path would not compromise the future by courting major ecosystem changes and unwelcome surprises.

Another article of faith is that the *Market Forces* development strategy would deliver the social basis for sustainability. The hope is that general economic growth would reduce the ranks of the poor, improve international equity and reduce conflict. But again, the theoretical and empirical foundations for such a salutary expectation are weak. Rather, the national experience in industrial countries over the last two centuries suggests that directed social welfare programs are required to ameliorate the dislocation and impoverishment induced by market-driven development. In this scenario, global poverty would likely persist as population growth and skewed income distributions combine to negate the poverty-reducing effect of growth in average income.

Even if a *Market Forces* future were able to deliver a stable global economic system—itself a highly uncertain hypothesis—the scenario offers no compelling basis for concluding that it would meet the ethical imperatives to pass on a sustainable world to future generations and to sharply reduce human deprivation. Economic and social polarization could compromise social cohesion and make liberal democratic institutions more fragile. Resource and environmental degradation would magnify domestic and international tensions. The unfettered market is important for economic efficiency, but only a fettered market can deliver on sustainability. Environment, equity and development goals are supra-market issues that are best addressed through democratic political processes based on widely shared ethical values and informed by scientific knowledge.

The dream of a *Market Forces* world is the impulse behind the dominant development paradigm of recent years. As the tacit ideology of influential international institutions, politicians and thinkers, it often appears both reasonable and the only game in town. But drifting into the complexity of a global future by relying on such old mind-sets is the sanctuary for the complacent and the sanguine. Ensuring a transition to a sustainable global future requires an alternative constellation of policies, behaviors and values. "Business-as-usual" is a utopian fantasy—forging a new social vision is a pragmatic necessity.

3. Where Do We Want to Go?

*P*ondering the forecaster's question—where are we going?—has led us not to clear answers about the global future, but to disquieting uncertainties. The global trajectory, extrapolated into the future assuming the persistence of dominant trends and values, becomes contradictory and unstable. The curve of development splits into numerous possibilities, with some branches pointing toward barbarous social-scapes and ecological impoverishment. But humans are travelers, not lemmings, who can also ask the traveler's question—where do we want to go? Vision and intentionality is the freedom that draws us forward as surely as the past pushes us onward.

Goals for a Sustainable World

From the tumult of the twentieth century, four great human aspirations crystallized for global society—peace, freedom, material well-being and environmental health. In this century a great transition will need to achieve them.

Peace was to be assured after World War II, but amidst the nuclear arms race, it would be maintained globally but not locally through the long Cold War. The international fight for freedom also began in the late 1940s with the struggle to end imperialism and colonialism, to extend human rights and to combat totalitarian oppression. Then, came a wave of national independence and an international initiative to assist poor countries that aspired to the development standards of the wealthy nations. Lastly, the concern for the well-being of the earth itself emerged in the 1970s, initially focused on natural resources and the human environment, and later extended to the complex systems that support life on Earth.

Now in the early years of the twenty-first century issues of peace and freedom arise again, not only from the many ongoing armed conflicts, but also from acts of terror against non-combatants.

Grappling with these new threats jeopardizes democratic freedoms. The transition beyond war and conflict is part of the sustainability transition. Human rights—economic and social as well as political—need to become universal. Democratic rule, with minority autonomy and rights, needs to be maintained and extended. International conventions already codify many of these goals. For their promise to be fulfilled, they need worldwide ratification and means of enforcement.

The core challenge of development is to meet human needs for food, water and health, and provide opportunities for education, employment and participation. Economically productive and equitable societies can provide literacy, primary and secondary education, and widespread access to advanced education. The end of hunger and deprivation, and the universal right to a healthy and full life are achievable by 2050.

A resilient and productive environment is the precondition for sustaining peace, freedom and development. Preserving the essential health, services and beauties of the earth requires stabilizing the climate at safe levels, sustaining energy, materials and water resources, reducing toxic emissions and maintaining the world's ecosystems and habitats.

At the beginning of a new century, these grand goals for humanity have not been fulfilled, although there has been progress in pursuit of all. The challenge for the future is fashioning a planetary transition that realizes the dream of a more peaceful, free, just and ecologically conscious world.

Bending the Curve

Sustainability goals have been articulated in a long series of formal agreements on human rights, poverty and the environment. But noble sentiments have not been matched by sufficient policy commitments. The vision of sustainability has been a virtual reality superimposed on the real-world push for market globalization.

The broad goals express a powerful ethos for a sustainable world. This is the stirring but intangible music of sustainability. Also needed are the lyrics and the dance—specific targets to concretize

the goals and policy actions to achieve them. The *Policy Reform* scenario visualizes how this might occur. The essence of the scenario is the emergence of the political will for gradually bending the curve of development toward a comprehensive set of sustainability targets.

We examined the prospects for a *Policy Reform* future in detail in a previous study (Raskin et al., 1998). The scenario is constructed as a backcast. We begin with a vision of the world in 2025 and 2050 in which minimum sets of environment and social targets have been achieved. We then determine a feasible combination of incremental changes to the *Market Forces* trajectory for meeting these goals. A narrative sketch of a *Policy Reform* scenario is presented in the box below.

What targets are achievable in a *Policy Reform* context? Widely discussed social and environmental objectives provide useful guidance on the scope of the challenge. Naturally, any quantitative targets are provisional, and subject to revision as knowledge expands, events unfold and perspectives change. *Policy Reform* targets for each of the broad sustainability goals—peace, freedom, development and environment—are discussed below and shown graphically in Figure 6, where they are contrasted with patterns in the *Market Forces* scenario.

Peace

The *Policy Reform* path would offer an historic opportunity to address the scourge of war. It seeks an inclusive form of global market development that sharply reduces human destitution, incorporates countries in common international regulatory and legal frameworks and strengthens global governance. The scenario would mitigate underlying drivers of socio-economic, environmental and nationalistic conflict, while adopting international mechanisms for fostering peace and negotiated settlements. In the last decade of the twentieth century, there was an average of 28 major armed conflicts—that is, conflicts that resulted in at least 1,000 battle-related deaths in any single year. The scenario goal is to reduce these to a mere handful by the year 2050.

Freedom
The right of all to participate fully in society without discrimination or bias is a basic right of democratic development. The gradual conferral of equality to women, ethnic groups and racial minorities is a notable achievement of recent decades. The process of eliminating gender and ethnic inequality would accelerate under sustainable development, and could be largely completed by 2050. Figure 6 illustrates this for gender equity as measured by the Gender-Related Development Index that compares life expectancy, educational attainment and income between men and women (UNDP, 2001).

Development
Poverty reduction is the key development goal of the scenario. The incidence of chronic hunger, which now afflicts over 800 million people, is a strong correlate of the poverty nexus. The World Food Summit's call to halve hunger by the year 2015 (FAO, 1996) may have been overly ambitious in light of slow recent progress. The scenario target is to halve hunger by 2025 and halve it again by 2050. Other measures of poverty, such as lack of access to freshwater and illiteracy, have similar patterns of reduction in the scenario. Another useful indicator is average lifespan, which correlates with general human health. With accelerated effort, longevity, which today averages about 60 years in developing countries, could reach 70 years in all countries by 2025, and approach 80 years by 2050.

Environment
Environmental sustainability means reducing human impacts to levels that do not impoverish nature and place future generations at risk. Indicators for climate change, ecosystem loss and freshwater stress are shown in Figure 6.

- The goal for climate change is to stabilize concentrations of greenhouse gases in the atmosphere at safe levels (UNFCCC, 1997). Atmospheric concentrations of carbon dioxide (CO_2), the most important greenhouse gas, have risen from pre-industrial levels of 280 parts per million by volume (ppmv) to about 360 ppmv today. Since the momentum of increasing

emissions is inexorable and CO_2 persists in the atmosphere for centuries, climate change cannot be avoided, but it can be moderated. A reasonable, although challenging, goal is to stabilize CO_2 at 450 ppmv by the year 2100. This would keep the cumulative increase in average global temperature below 2°C, a gradual enough change to allow most ecosystems and species to adapt (IPCC, 2001). This will require that greenhouse gas emissions in industrial countries be cut in half over the next 50 years to give "atmospheric space" for poor countries to slowly converge toward common low-emission global standards late in the twenty-first century.

- Climate change is a threat to ecosystems and biodiversity, but not the only one. Land conversions, disruption of freshwater patterns and pollution all contribute. At the least, sustainability requires maintaining sufficient natural areas to ensure adequate protection of ecosystems and associated biodiversity (CBD, 2001; CCD, 2001). Currently, 25 percent of the earth's land is degraded and more than one-fifth of the world's tropical forests have been cleared since 1960 (Watson et al., 1998). A minimum sustainability goal is to halt the loss of ecosystems by 2025 and thereafter begin the process of restoration, a pattern reflected in the targets for forests. While this implies further loss, it is not feasible to completely reverse the tide of destruction in a growing global economy (Raskin et al., 1998).

- Freshwater policy is critical to meeting both environmental and social goals. Today, nearly a third of the world's population is living under moderate or severe water stress (Raskin et al., 1998). As water demands grow, conflict increases in two broad ways—between users in shared river basins and between humanity and nature. The scenario seeks to meet human requirements—the basic needs of people, agriculture and the economy—while maintaining ecosystems. Current trends are not promising—in *Market Forces* the number of people living in water-scarce conditions more than doubles by 2025. A minimum sustainability goal is to moderate water stress through policies to promote water efficiency, waste water recycling and

source preservation. Figure 6 shows how water stress could begin to abate with the commitments to water-use efficiency and water resource protection of *Policy Reform*.

Figure 6. Policy Reform and Market Forces Compared: Selected Indicators for Peace, Freedom, Development and Environment
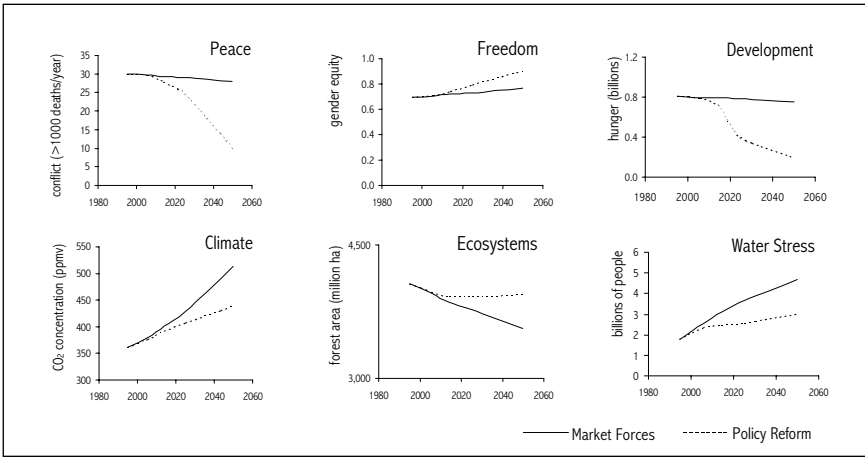
In a *Policy Reform* world, "growth with equity" becomes the prevailing philosophy of development strategies. A host of initiatives increase the incomes of the poor. Reinvigorated multi-national and bi-national livelihood programs build human and institutional capacity. The flow of investment toward the poorest communities and technological transfers accelerate. Market mechanisms for reducing global greenhouse gas emissions and other environmental goals provide additional revenue streams to developing countries, and contribute to the convergence of incomes between developing and industrialized regions. Also, population growth moderates as access to education and effective family planning programs expand.

Relative to unfavorable *Market Forces* trends, the scenario promotes two kinds of equity—between rich and poor countries and within each country. Actions taken to reduce poverty also reduce the immense disparities between the rich and the poor that cleave the current social landscape. Beyond poverty reduction, greater equity in the distribution of wealth between and within countries promotes

social cohesion and resilient basis for a peaceful global system. Today the average income in rich countries is nearly seven times that in the rest of the world (and 35 times that in the poorer countries). The scenario reduces this ratio to below 3 by 2050. National equity—defined by the ratio of the incomes of the poorest 20 percent to those of the richest 20 percent, for example—has been declining in many countries. In the *Policy Reform* scenario the drift toward greater inequality is reversed (Raskin et al., 1998).

The environmental goals require substantial decreases in the environmental impacts imposed by rich economies. Elsewhere, impacts increase and then moderate, as poor economies converge toward rich country patterns. On the demand side, the efficiency of energy, water and resource use rapidly increases. On the production side, the transition to renewable energy, ecological agricultural and eco-efficient industrial systems accelerates. *Policy Reform* shows how, with sufficient political commitment, a comprehensive set of policies could begin to redirect development towards sustainability.

These social and environmental initiatives are mutually reinforcing aspects of a unitary project for sustainability. When the poor have access to health care, education and economic security, population growth tends to fall. Poverty reduction helps protect environmental resources, since poverty is both a cause and an effect of environmental degradation. Environmental stability provides the material basis for economic welfare which, in turn, is a precondition for social and economic equity. Greater equity supports cohesion at community, national and global levels. Human solidarity and healthy environments reduce the threat of violence and conflict.

Policy Reform: A Narrative

With the long view of history, globalization stands out as the major theme of the last decades of the twentieth century. Like all turning points, the onset of the planetary phase of world development carries contradictory phenomena in its wake. Superficially, it seems that the dominant engine for change is the rapid advance of a global market system, catalyzed by distance-shrinking transportation and information technology. But a second powerful force, reacting to the predations of heedless global markets, also quietly gestates—the movement for an environmentally sustainable and humane form of development.

The momentum for *Policy Reform* is traced through a series of UN initiatives—the 1972 Stockholm Conference on the Human Environment, the 1987 World Commission on Environment and Development and the 1992 Rio Earth Summit. While these had little immediate effect, in the fullness of time it is clear that they are essential precursors to the remarkable changes of the first decades of the twenty-first century. But it did not seem that way at the time.

Indeed, at the end of the twentieth century, the international momentum for a sustainable future seems squandered. The calls at global conferences for a cohesive agenda for sparing the environment and bringing development to the poor regions of the world appears rarely to go beyond rhetoric to effective action. Special interests squabble, powerful nations resist aligning their development with global environmental goals, and a fragmented system of global governance holds an unending series of topical conferences that offer inspiring but toothless edicts.

But after 2002 history has begun to swing toward sustainable development. A number of factors combine to tilt the balance. The World Summit on Sustainable Development, held in Johannesburg in that year, is a hinge event. The political space for the reform agenda comes in part from the end of market euphoria, so triumphant in the 1990s. At the turn of the new century, a global recession is a reminder that the golden goose of the new prosperity is mortal and that e-commerce has not abolished economic uncertainties. Then the terrorist attacks of 9/11 rip the affluent world from its complacent slumber, at once kindling insecurity, anger and a sense that global development is not working.

Forged in the crucible of a war on terrorism, a new globalism offers an unprecedented opportunity for proactive and cooperative global engagement. The dose of reality persuades government that the internationalization of market opportunities and institutional modernization must proceed on an accelerated basis. The vision at first is confined to delivering on the promise of globalization to assimilate the disaffected and excluded of the earth in the nexus of Western modernism. Free trade institutions are expanded, global governance for the economy is strengthened and international assistance supports a new generation of business and political leaders. At first the vision of an inclusive market-driven world has a salutary effect on the global economy and international security. But the response is insufficient.   *(continued)*

Policy Reform: A Narrative

The environment continues to degrade. The scientific case strengthens that human activity is imperiling global environmental stability. The public grows increasingly impatient, seeing its own evidence in abrupt climate events and mounting reports of species loss. The global economy sputters, and a sense of crisis is amplified by ecological uncertainty and social polarization. In poorer regions, people bitter about the continued failure of globalization to reduce poverty and feeling the bite of climate change demand a new global deal. A combined social, economic and environmental crisis is brewing.

The search begins for a more inclusive, democratic and secure form of development. The world-wide coalition, which began in the fight against global terrorism, extends its mandate to include multilateral action on the environment, arms reduction, international justice and poverty reduction. The goals of international security and sustainable development become interlaced. The media responds and amplifies the mounting environmental and social concerns. NGOs acting through international networks expand their influence. The Internet fuels the global clamor for action. A growing segment of the multinational business community, alarmed at the uncertainties and threats to global stability, become advocates of global policies that reduce risks and provide a level playing field for business.

New political leaders committed to concerted action eventually heed these rising voices. A global consensus emerges on the urgent need for policies to secure environmental resilience and to sharply reduce poverty. The *Policy Reform* response seeks to balance the agendas of those who want no change—*Market Forces* advocates—and those seeking a more fundamental shift in development values—*Great Transition* advocates. The market remains the basic engine for economic growth, supported by trade liberalization, privatization and the global convergence toward the model of development of the rich countries. But globally negotiated targets for environment sustainability and poverty reduction are the basis for constraining and tempering the market. The United Nations is reorganized and its mission refocused on the *Policy Reform* agenda.

The allocation of regional and national responsibilities takes account of the need for rich countries to radically reduce their environmental footprint while assisting poor countries to reduce poverty, to build human capacity and to leapfrog to resource-sparing and environmentally sound technology. The mix of policy instruments for achieving goals—economic reform, regulation, voluntary action, social programs and technology development—varies among regions and nations. Progress toward the global targets is monitored carefully and adjusted periodically. Gradually, global environmental degradation moderates and extreme poverty declines.

Limits of the Reform Path

The *Market Forces* scenario, we have argued, would undermine its own stability by compromising ecological resilience and social coherence. The *Policy Reform* scenario seeks sustainability by constraining market globalization within politically imposed social and environmental targets. But is it enough?

Policy Reform brings both good news and bad news. The good news is that great strides toward a sustainability transition are possible without positing either a social revolution or the *deus ex machina* of a technological miracle. The scenario shows that deep environmental degradation is not a necessary outcome of development. It can be mitigated by new choices for technology, resources and production processes. The cumulative effects of a comprehensive family of feasible incremental adjustments can make a substantial difference. Similarly, poverty and extreme inequity are not inevitable, but result from social policy choices. The long battle against human misery can gradually be won by major actions to promote sustainable livelihoods and greater international and social equity.

The bad news comes in two categories. The first concerns the immense technical challenges of countering conventional development with a reform program. Recall that the *Policy Reform* scenario assumes that the underlying values, lifestyles and economic structures of *Market Forces* endure. *Policy Reform* shows that wise policies on resource efficiency, renewable resources, environmental protection and poverty reduction can, in principle, provide a counter balance. But the required pace and scale of technological and social change is daunting. The reform path to sustainability is like climbing up a down escalator.

The second category of bad news is even more discouraging. The scenario's plausibility rests on a strong postulate—the hypothesis of sufficient political will. For the reform path to succeed, an unprecedented and unyielding governmental commitment to achieving sustainability goals must arise. That commitment must be expressed through effective and comprehensive economic, social and institutional initiatives. But the necessary political will for a reform route to sustainability is today nowhere in sight.

To gain ascendancy, the *Policy Reform* vision must overcome the resistance of special interests, the myopia of narrow outlooks and the inertia of complacency. But the logic of sustainability and the logic of the global market are in tension. The correlation between the accumulation of wealth and the concentration of power erodes the political basis for a transition. The values of consumerism and individualism undermine support for a politics that prioritizes long-range environmental and social well-being. If the dominant interests of popular constituencies and influential power brokers are short-term, politicians will remain focused on the next election, rather than the next generation. It seems that overcoming the dissonance between rhetoric and action will take fundamental changes in popular values, lifestyles and political priorities that transcend *Conventional Worlds* assumptions.

From Sustainability to Desirability

So, *Policy Reform* may not be enough. Taming the juggernaut of conventional globalization with sustainability reforms faces significant technical and political challenges. To these pragmatic concerns about the feasibility of the reform path may be added a normative critique: is it desirable? It envisions a more crowded and engineered global emporium, albeit one where the environment continues to function and fewer people starve. But would it be a place of contentment, choice, and individual and social exploration? It might be a sustainable but undesirable world.

Policy Reform is the realm of necessity—it seeks to minimize environmental and social disruption, while the quality of life remains unexamined. The new sustainability paradigm transcends reform to ask anew the question that Socrates posed long ago: how shall we live? This is the *Great Transitions* path, the realm of desirability.

The new paradigm would revise the concept of progress. Much of human history was dominated by the struggle for survival under harsh and meager conditions. Only in the long journey from tool making to modern technology did human want gradually give way to plenty. Progress meant solving the economic problem of scarcity. Now that problem has been—or rather, could be—solved. The precondition for a new paradigm is the historic possibility of a post-scarcity world

Figure 7. Fulfillment Curve
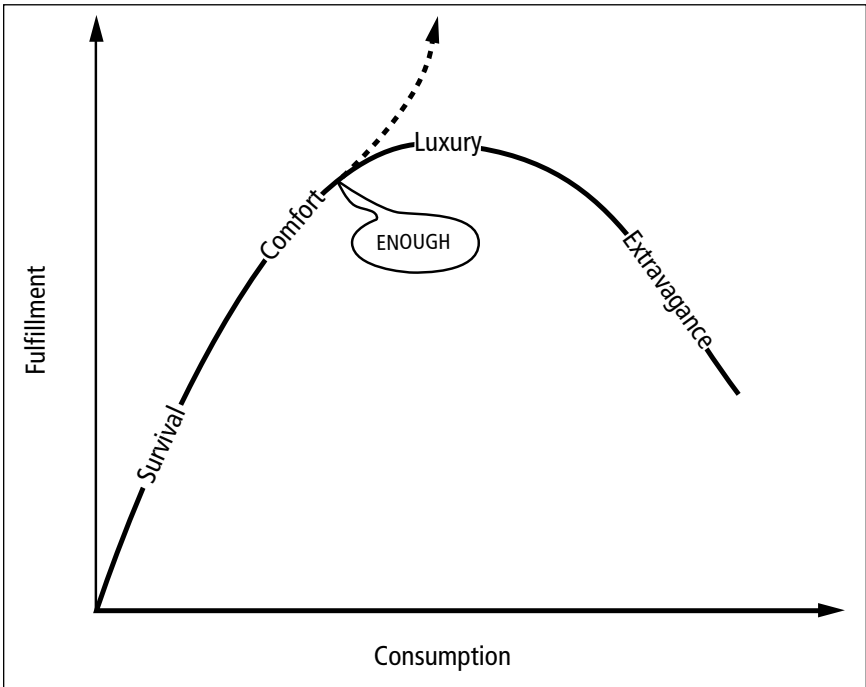
Based on Dominguez and Robin (1992).

where all enjoy a decent standard of living. On that foundation, the quest for material things can abate. The vision of a better life can turn to non-material dimensions of fulfillment—the quality of life, the quality of human solidarity and the quality of the earth. With Keynes (1972), we can dream of a time when "we shall once more value ends above means and prefer the good to the useful."

The compulsion for ever-greater material consumption is the essence of the growth paradigm of conventional worlds. But acquisition as an end in itself can be a substitute for contentment, a hunger that knows no food. The "fulfillment curve" illustrates the erroneous identification of the level of consumption and the quality of life (Figure 7). Past a certain point ("enough"), increased consumption fails to increase fulfillment. Additional costs exceed the marginal satisfaction of additional luxuries as we work to pay for them, learn to use them, maintain and repair them, dispose of them and perhaps feel

guilty about having them when others have so little. Profligate consumption sacrifices the cultivation of other aspects of a good life—relationships, creativity, community, nature and spirituality—that can increase fulfillment (the dotted branch in the figure).

A *Great Transition* is galvanized by the search for a deeper basis for human happiness and fulfillment. This has been expressed through diverse cultural traditions. In the new sustainability paradigm, it becomes a central theme of human development. Sustainability is the imperative that pushes the new agenda. Desire for a rich quality of life, strong human ties and a resonant connection to nature is the lure that pulls it toward the future.

Is such a vision possible? It does not seem promising judging by the global scene today, so full of antagonism, inequity and the degradation of nature and the human spirit. Yet, the cunning of history is sure to bring surprises. Some may not be welcome. But favorable possibilities are also plausible.

Later we offer a "history of the future," a hypothetical account of the initial stages of a *Great Transition*. It is written from the perspective of the year 2068 as the transition continues to unfold. What lies beyond this process of change? More change, no doubt. Though an ideal planetary society can never be reached, we can imagine good ones. Distant visions guide the journey. One possibility is sketched in the following box.

A Distant Vision

Here is a civilization of unprecedented freedom, tolerance and decency. The pursuit of meaningful and fulfilling lives is a universal right, the bonds of human solidarity have never been stronger and an ecological sensibility infuses human values. Of course, this is not paradise. Real people live here. Conflict, discontent, mean-spiritedness and tragedy have not been abolished. But during the course of the twenty-first century the historic possibility was seized to redirected development toward a far more sustainable and liberatory world.

The fabric of global society is woven with diverse communities. Some are abuzz with cultural experimentation, political intensity and technical innovation. Others are slow-paced bastions of traditional culture, direct democracy and small-is-beautiful technology. A few combine reflection, craft skill and high esthetics into a kind of "sophisticated simplicity," reminiscent of the Zen art of antiquity. Most are admixtures of countless subcultures. The plurality of ways is deeply cherished for the choice it offers individuals and the richness it offers social life.

The old polarizing dualities—cosmopolitanism versus parochialism, globalism versus nationalism and top-down versus bottom-up—have been transcended. Instead, people enjoy multiple levels of affiliation and loyalty—family, community, region and planetary society. Global communication networks connect the four corners of the world, and translation devices ease language barriers. A global culture of peace and mutual respect anchors social harmony.

The World Union (née the United Nations) unifies regions in a global federation for co-operation, security and sustainability. Governance is conducted through a decentralized web of government, civil society and business nodes, often acting in partnership. Social and environmental goals at each scale define the "boundary conditions" for those nested within it. Subject to these constraints, the freedom to fashion local solutions is considerable—but conditional. Human rights and the rights of other governance units must be respected. While sophisticated conflict resolution processes limit conflict, the World Union's peace force is called on occasion to quell aggression and human rights abuse.

Preferred lifestyles combine material sufficiency and qualitative fulfillment. Conspicuous consumption and glitter are viewed as a vulgar throwback to an earlier era. The pursuit of the well-lived life turns to the quality of existence—creativity, ideas, culture, human relationships and a harmonious relationship with nature. Family life evolves into new extended relationships as population ages and the number of children decreases. People are enriched by voluntary activities that are socially useful and personally rewarding. The distribution of income is maintained within rather narrow bounds. Typically, the income of the wealthiest 20 percent is about two or three times the income of the poorest 20 percent. A minimum guaranteed income provides a comfortable but very basic standard of living. Community spirit is reinforced by heavy reliance on locally produced products, indigenous natural resources and environmental pride.   *(continued)*

A Distant Vision

The economy is understood as the means to these ends, rather than an end in itself. Competitive markets promote production and allocation efficiency. But they are highly fettered markets tamed to conform to non-market goals. The polluter pay principle is applied universally, expressed through eco-taxes, tradable permits, standards and subsidies. Sustainable business practices are the norm, monitored and enforced by a vigilant public. Investment decisions weigh carefully the costs of indirect and long-term ecological impacts. Technology innovation is stimulated by price signals, public preferences, incentives and the creative impulse. The industrial ecology of the new economy is virtually a closed loop of recycled and re-used material, rather than the old throwaway society.

Some "zero growth" communities opt to maximize time for non-market activities. Others have growing economies, but with throughputs limited by sustainability criteria. In the formal economy, robotic production systems liberate people from repetitive, non-creative work. Most everywhere a labor-intensive craft economy rises alongside the high technology base. For the producer, it offers an outlet for creative expression; for the consumer, a breathtaking array of esthetic and useful goods; for all, a rich and diverse world.

Long commutes are a thing of the past. Integrated settlements place home, work, shops and leisure activity in convenient proximity. The town-within-the-city balances human scale community with cosmopolitan cultural intensity. Rural life offers a more serene and bucolic alternative, with digital links maintaining an immediate sense of connectedness to wider communities. Private automobiles are compact and pollution free. They are used in niche situations where walking, biking and public transport options are not available. Larger vehicles are leased for special occasions and touring. Advanced mass transportation systems link communities to local hubs, and those hubs to one another and to large cities.

The transition to a solar economy is complete. Solar cells, wind, modern biomass and flowing water generate power and heat buildings. Solar energy is converted to hydrogen, and used, along with direct electricity, for transportation. Advanced bio-technology is used cautiously for raw materials, agriculture and medicine. Clean production practices have eliminated toxic pollution. Ecological farming makes use of high inputs of knowledge, and low inputs of chemicals to keep yields high and sustainable. Population stabilization, low-meat diets and compact settlements reduce the human footprint, sparing land for nature. Global warming is abating as greenhouse gas emissions return to pre-industrial levels. Ecosystems are restored and endangered species are returning, although scars remain as reminders of past heedlessness.

This is not the end of history. In some sense, it is the beginning. For at last, people live with a deep awareness of their connection to one another, future generations and the web of life.