

Scenarios for the 21st Century: Economic Justice, Ecological Integrity, Accountable Global Governance, Appropriate Technology

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EXECUTIVE SUMMARY

This exercise develops an advocated scenario of global development for the next 150 years that addresses important questions regarding economic justice, ecological integrity, accountable global governance and appropriate technology. Under this scenario we achieve by 2150 a world characterized by high levels of per capita GDP (\$82,000 1990 US \$); equality of per capita GDP among countries; the absence of poverty; moderate and non-increasing economic inequality among individuals (a ratio of top and bottom income quintiles of 6.5:1); very slow economic growth (0.5%/year); moderately high and non-increasing levels of energy consumption (60 terawatts); stable world population (9 billion); high technological density; a globally integrated, social democratic/internationalist governance regime; strong social controls over potentially destabilizing technologies; and a deeply embedded global ethos that supports these conditions. An unresolved tension concerns the years beyond 2150. Although high, stable levels of resource throughput can be maintained indefinitely after that time, even slow output growth would eventually require massive technological transformation of the natural world. The scenario of world development that this exercise constructs gets us to a point in 2150 that is both desirable in itself and that will make it easier for us to negotiate the subsequent transitions, whatever they might be.

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INTRODUCTION

This exercise develops an advocated scenario of global development for the next 150 years that addresses important questions regarding economic justice, ecological integrity, accountable global governance and appropriate technology.

The first part of this exercise presents a simple model for developing quantitative scenarios of long-range global development, reviews political-economic and other narrative scenarios of global development, and suggests a framework for integrating quantitative and narrative scenarios. The second part analyzes in detail problematic aspects of various scenarios. The third part pulls together the findings of the previous parts, presents a scenario of global development intended to fulfill the stated objective of the exercise, identifies unresolved tensions, and concludes.

Motivation

I worked for most of the 1970's as an activist within the broad movement for social and economic justice, and for most of the 1980's and 1990's within those sectors of the environmental movement that promoted ecological awareness as a critical component of a larger vision of social change. Participants in these efforts were motivated by encompassing visions of a just, sustainable world. The accomplishments of these movements have been many, but their larger social, political and economic hopes and dreams have not come to pass.

Over recent decades the prevailing political economic ideology has been a neoliberal democratic capitalism heavily dependent upon technological innovation and global integration. It holds out a vision of the future in which continuing technological innovation allows economic output to grow indefinitely without endangering environmental values, continuing growth diminishes the importance of distributional inequities, and a libertarian-democratic ethos empowers the individualist initiatives upon which technology and growth depend.

Even its defenders recognize that this ideology is not without contradictions. In the absence of a global social contract significant portions of the world's population could be left far behind while a majority prospers. Those sectors doing well could still experience growing inequalities of wealth and power. Many persons sense that as traditional vehicles of cultural meaning and cohesion become increasingly eroded or commodified, thresholds might be crossed that generate unforeseen, undesirable societal consequences. The prospect of a future in which continued economic growth requires continually more intensive technological manipulation of the natural world leaves many people uneasy. Even as neoliberalism encourages the spread of formal democracy, global economic integration renders the prospects of substantive democracy more problematic. Finally, many people are dismayed by the thesis implicit within neoliberal capitalism that the highest aspirations of humankind can largely be achieved through the individual acquisition of increasingly greater quantities of commercial goods and services.

But what is the alternative? Persons concerned about growing inequality, the impact of economic growth on the environment, the technological manipulation of the natural world, or the erosion of social values have no credible, compelling alternative models at hand. Historically we've advocated either the widespread application of external social controls, or the widespread internalization of solidaristic social values, or both. For most of the past century the primary vehicles for externalized social controls have been welfare states of the left or the right. Over the same period the primary vehicles for the widespread internalization of solidaristic values have been either traditional cultures grounded in religion, or socialist cultures grounded in modernism. The success of neo-liberalism has meant the rejection of welfare-statism in favor of libertarian democracy, and the rejection of solidaristic values of both religion and socialism in favor of secular, individualist and market-centered values. As a result, these long-standing foundational elements of an alternative to neoliberalism are not now as deeply or widely held as they once were.

I believe that in the coming years the inadequacies of neoliberalism will generate increasingly urgent desires for reforms, for structural change, and for changes in the constellation of values that neoliberalism is both supported by and reinforces. This exercise seeks to present a way in which a particularly critical set of such reforms, and structural and normative changes, might be understood as a coherent single project.

The scenario framework

A scenario is a story about how things could turn out in the future. Typically, scenarios consider a collection of factors that are judged to be important, and that can change over time and have some bearing upon one another. For a scenario to be credible, changes over time in the important factors must be internally consistent. The major important factors considered in the scenario developed in this exercise are economic justice, ecological integrity, democratic governance and appropriate technology.

The scenario developed in this exercise is an *advocated* scenario. An advocated scenario is one that its author would like to see happen, believes can happen, and is working, or intends to work, to make happen. Advocated scenarios differ from academic scenarios, which are not necessarily desired by anyone, or, if they are, are not developed primarily as part of an advocacy effort. They also differ from utopian scenarios, which as defined here are scenarios that are not believed to be credible.

My decision to develop an advocated scenario, rather than an academic or utopian scenario, imposes strong constraints on the final product. At a minimum, the quantitative elements of the scenario must be strongly grounded in empirical data, and the narrative or qualitative elements must be intuitively credible to large numbers of people. Beyond this, the scenario must be compelling, that is, it must be able to motivate large numbers of people to want to help make it happen.

The scenario framework itself helps ensure credibility because it forces the author, and readers, to acknowledge when important values are in conflict and to take stands on how these conflicts are to be resolved.

The scenario framework also helps facilitate criticism and discourse. Any readers who believe that the scenario advocated here is undesirable, non-credible or non-compelling can use the framework to develop alternative scenarios that they would be willing to advocate.¹

Outline and description

Section I reviews quantitative scenarios of world development constructed by other authors and presents the model for constructing scenarios that I use in this exercise.

I construct a reference scenario and five policy scenarios. Section I continues by evaluating largely narrative scenarios developed in the post-war period that projected world development to 2000. I apply insights from that exercise to assess a large collection of recently prepared scenarios that project world development into the 21st century.

These exercises help us clarify important questions that need to be answered in order to judge the credibility of any attempt to construct scenarios for the coming century. Some of these questions lend themselves to quantitative analysis. Are there true biogeophysical limits to economic growth? If so then scenarios that project unending growth are not credible. Are there limits to growth imposed by social factors? If continued growth generates economic inequalities that cannot be constrained through policy, social cohesion may so erode that further economic growth is impossible. As societies grow do they become so complex that they can no longer function effectively? If so then complexity might serve as a limit to growth.

Other questions require more qualitative, or narrative, treatment. Does the current

¹ The Excel spreadsheet program for the scenario model developed for this exercise, Model A, is available on disk or by email by request.

trajectory of global economic growth and integration—“globalization”—so impact the structures of national and global governance, and so change the relations of political power, that it could become impossible to implement the policies necessary to overcome social and biogeophysical limits? If so then neoliberal globalization sows the seeds of its own exhaustion. Even if a strong case can be made that continued technological innovation should enable us to avoid foreseeable biogeophysical limits on growth, could it be that these same technologies have qualities that make them otherwise unacceptable? If so then biogeophysical limits return as real limits to continued economic growth.

Section I concludes by presenting a framework for integrating quantitative and narrative scenarios. I provisionally identify one integrated scenario as the ideal scenario. I test the credibility of the ideal scenario, and other scenarios, throughout the rest of this exercise.

Section II addresses critical questions identified in Section I. Section II.A.1 reviews the history and theory behind the “limits-to-growth” debate. Sections II.A.2 and II.A.3 consider the empirical evidence regarding biogeophysical limits, and limits on the ability of technology to overcome these. Section II.A.4 considers the possibility that complexity is a limit to growth. Section II.B considers the reciprocal influence of economic inequality and economic growth. This section also assesses policy proposals for reducing inequality, and public opinion about inequality. Section II.C evaluates the scenario of Green sustainability. This section includes results from a survey conducted at a major conference on Voluntary Simplicity, and reviews results from other surveys. Section II.D considers the challenges of globalization and global governance. Section II.E assesses possible trajectories of technological innovation over short-, middle- and long-run periods. This section pays particular attention to the profound challenges presented by the new human genetic technologies.

Section III pulls together the findings of all the topics considered to this point, presents an integrated quantitative and narrative scenario of global development that seeks to fulfill the stated objective of this exercise, identifies unresolved tensions, and concludes.

Two central themes

In the course of achieving its stated objective this exercise focuses attention on two themes that are central to its task and that, in my estimate, have not been as fully integrated into the debate over growth, the environment, and the human future as they need to be. These are:

1) *The critical importance of distributional equity* - Throughout the quarter century since the publication of *The Limits to Growth*, pro-growth advocates have charged that environmentalism is an ideology of a privileged elite whose construction of “nature” is in fact a covert strategy of domination over less privileged peoples and communities. Environmentalists deny this, but our models of sustainable development rarely grapple with distributional concerns at the level of specificity that reveals a commitment to engage this issue. This exercise seeks to fully engage the issue of distributional equity and incorporate it into our model of global development.

2) *The implications of pending profound technological developments.* Technological innovation increases our ability to manipulate matter and energy at increasingly finer scales of space and time. It has impacts on the nature of social life that are far more profound than its celebrated role in allowing output to increase by 2 percent or so per year. Ultimately, the acceptability of a future of continued economic growth through technological innovation will depend on the acceptability of the increasingly more profound manipulation of the natural world. This exercise attempts to characterize salient features of such a future, and to gain insight into the ways that people understand these features and the concerns they raise.

Concluding note

Do I really believe that it's legitimate to try to specify such values as the desired level of per capita income in 2150 for the fourth population quintile in China? The answer is yes. The quantitative figures given in our advocated scenario for any future time are not predictions--they are goals that we can choose to work toward. Clearly, goals can and should be reassessed as circumstances and judgments change. But scenarios such as the one developed in this exercise can importantly inform the values that each of us works to realize in our lives and our communities today, and to pass to the next generation tomorrow.

ABOUT THE TEXT

This exercise is structured as an analytic narrative. It seeks to establish a strong case for a particular scenario motivated by stated normative values and grounded in thorough empirical analysis. The sections of the exercise are presented in roughly the order in which I prepared them, and a narrative arc shapes the text. During my work on the early sections I believed that I would be able to make a good case that the ideal scenario, Scenario 5, was credible and compelling. As my work proceeded, however, this became increasingly difficult to do, and about half-way through I realized that I could not do it. This turning point in my thinking is noted in Section II.C.4, the concluding section of the discussion of Green Sustainability. At that point the focus of the exercise shifts from Scenario 5 to Scenario 3, a less ideal but, I believe, more credible and still desirable scenario. The two final sections of Part II, addressing governance under conditions of globalization and the social implications of technological change, test further the credibility and desirability of Scenario 3.

This exercise is long. To assist the reader, I've provided a narrative summary and a quantitative summary of the conclusions, immediately below. In addition, each key section of the main text begins with a summary of the conclusions of that section.

This exercise is based on a dissertation prepared under the auspices of the University of California at Berkeley Energy and Resources Group doctoral program. Research for the dissertation began in 1995 and was largely completed by the end of 1998. Writing was largely finished in the first months of 2000. Shortly after that I began a leave of absence from the doctoral program and put the text aside for the better part of three years. During the summer of 2003 I began preparing the text for submission. Although much new information bearing on the topics addressed in the dissertation had become available during my leave, I concluded, after review, that I saw no reason to modify the presentation or the conclusions drawn. The current text is based largely on that of the version prepared in early 2000.

NARRATIVE SUMMARY OF CONCLUSIONS

Economic inequality among and within countries is very great. Continued global economic growth is necessary if economic inequality is to be reduced. Efficient markets, innovative technology and effective public sector regulatory policies should be able to allow economic growth to continue for the coming 150 years without critically endangering ecological integrity. Continued growth can be expected to reduce inequality among persons within developing countries, but may increase inequality among persons within developed countries. However, policies can be implemented that should be able to prevent such increases in inequality. Continued global economic integration—globalization—both encourages and is encouraged by continued economic growth and technological innovation. Globalization undercuts the ability of nation states to adopt and enforce the sorts of policies that are needed to ensure ecological integrity and distributional equity. However, international and global institutions can be established that should be capable of addressing these concerns, and of doing so in a way that is sufficiently accountable to local publics to ensure legitimacy. In order for these institutions to function effectively—that is, to be able to ensure ecological integrity and distributional equity—there needs to be a global consensus about the desirability of these values, and a commitment to their realization. Continued economic growth and technological innovation make it both easier and more difficult to achieve such a consensus and commitment. To ensure that such a consensus and commitment are realized, concerned leaders and others will need to articulate and live in accordance with social norms that stress the importance of ecological integrity and distributional equity. If we wish to achieve economic equality among countries within the next 150 years, it will be necessary for the developed countries to grow slowly, and for the developing countries to grow rapidly, for most of that period. If we wish to ensure ecological integrity and avoid dependence upon undesirable technologies, per capita GDP growth in all sectors will need to converge to the same slow rates by 2150. At that time the world can be economically prosperous, income can be equitably distributed, levels of resource use can be sustained indefinitely, and

social democratic institutions of global governance can allow ecological integrity to be maintained and problematic technologies to be regulated. One set of powerful new technological innovations poses a particular challenge to our ability to generate the sort of global consensus and commitment that would allow economic growth to continue while ensuring ecological integrity and social equity. These are the new human genetic technologies. If these technologies are developed and begin to be used to modify existing human attributes, it is likely that our experience of being part of a common humanity with a shared future will be greatly eroded. Institutions of global governance will need to be able to constrain destabilizing technologies of this sort. An unresolved tension concerns the years beyond 2150. Although high, stable levels of resource throughput can be maintained indefinitely after that time, eventually even slow output growth would require massive technological transformation of the natural world. The scenario of world development that this exercise constructs and advocates gets us to a point in 2150 that is both desirable in itself, and that will make it easier for us to negotiate the subsequent transitions, whatever they might be.

QUANTITATIVE SUMMARY OF CONCLUSIONS

This exercise develops an advocated scenario of global development for the next 150 years that addresses important questions regarding economic justice, ecological integrity, accountable global governance and appropriate technology. The scenario includes the quantitative features shown below. After 2150 population, energy use and the distributions of income between and within countries are sustainable at the levels shown in that year. The rate of growth of per capita GDP, while very slow, remains positive and thus presents an unresolved tension.

	<u>2000</u>	<u>2050</u>	<u>2100</u>	<u>2150</u>
world population (billion)	6.2	9	9	9
per capita GDP (1990 US\$)				
world	4,877	12,587	42,605	82,000
low income countries	366	3,306	32,980	82,000
high income countries	26,689	49,000	63,000	82,000
ratio, high/low per capita GDP	73:1	15:1	2:1	1:1
per capita GDP growth (%/yr)				
world	1.4	2.5	2.3	0.5
low income countries	3.5	5.0	3.3	0.5
high income countries	1.7	0.5	0.5	0.5
energy use (TW)	13.6	29.2	45.1	60.0
energy intensity (w/\$GDP)	.45	.26	.12	.08
per capita income (1990 US\$)				
within low income countries				
bottom 20%	113	1,031	10,203	26,000
top 20%	876	7,425	69,435	169,000
ratio:	7.8:1	7.2:1	6.8:1	6.5:1
within high income countries				
bottom 20%	8,303	15,200	19,531	26,000
top 20%	54,208	99,368	127,511	169,000
ratio:	6.5:1	6.5:1	6.5:1	6.5:1
ratio, top 20% high income/ bottom 20% low income	489:1	96:1	13:1	6.5:1