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Green Economics and Concepts of Sustainability

Variants of Green Economics

What is Green economics? In one sense, it is the subject of this book. It is a growing branch of economics that deals with the environment, pollution and climate change, and the analysis and treatment of externalities. Its roots were developed by Arthur Pigou, whom we met earlier. Pigou analyzed the gap between the social and private impacts of decisions, as well as tools such as environmental or Green taxes, to close the gap or internalize the activities.

Additionally, there is a specialized field that calls itself *Green economics*. Its proponents tend to emphasize market and policy failures and express skepticism about the effectiveness of market mechanisms to produce efficient and equitable outcomes. We first introduce some of the key ideas from Green economics and then focus more closely on the key issue of sustainability.

A Vision of the Green Economy

Mainstream economics deals primarily with the workings of the market economy—health care, labor markets, and finance being some key areas. As analyzed in earlier chapters, mainstream environmental economics includes spillover effects in which market transactions have impacts outside the marketplace—to the health of humans and other life forms, to ecosystems, and to future climatic conditions.

The Green economy is a branch of economics that emphasizes the behavior of the *nonmarket systems that humans affect*.[1] An exemplary study of this area is found in a monograph by Michael Jacobs, *The Green Economy*.[2] This study has many points of commonality with the present work. However, it is highly skeptical about the ability to incorporate the environment into mainstream or "neoclassical" economics.

The mainstream view, largely adopted here, is that environmental goods and services are like normal ones except that they suffer from market failures. The remedy, in the mainstream view, is to correct the market failures and then proceed with business as usual. For example, if urban smog is the result of underpriced emissions of sulfur dioxide, then we need to price sulfur dioxide emissions properly, and the economy will then function properly.

While this view of neoclassical economics is oversimplified, it does capture the stance of mainstream economics on major environmental issues. What, in the view of Jacobs and his colleagues from Green economics, is wrong with this view? There are four major shortcomings that would need to be corrected in a truly Green economy. While I would not endorse these in their entirety, they are in the spirit of Green and need to be carefully weighed.

The first critique is that preferences (or the demands in supply and demand) do not reflect the interests of future generations. Current decisions are made by today's consumers and today's voters, and future generations have no say in these. Hence, if politicians today refuse to take steps to wreck the future oceans, future voters have no chance to vote them out of office.

A second and related shortcoming is that financial markets and public decisions do not properly weigh present and future. This bias to the present is reflected in discount rates (including market interest rates) that are too high. As is discussed in the section on behavioral biases below, too high a discount rate will overvalue present costs and undervalue future benefits. The generational tilt implies that the benefits of investments in ensuring the future health of the earth system, in preventing climate change, and in preserving precious environmental assets are undervalued. The future appears too small because of a defective telescope for viewing it.

A third major shortcoming is that mainstream economics is said to undervalue public goods such as environmental quality and environmental goods and services. These are undervalued because they are underpriced in a laissez-faire market economy. For example, certain species may become extinct because their breeding stock is underpriced and are therefore undervalued in the fish market. This applies even more powerfully for global public goods like climate change or protection of the ozone layer, where the market prices are not just low but zero. This point needs to be emphasized, but it is a key tenet of mainstream economics as well. Many prices for public goods are incorrect and indeed too low. This is seen in the fact that the price of carbon dioxide emissions in most sectors and most countries is zero and therefore well below the social costs.

A final area is that mainstream economics downplays the central concern—which in some sense encompasses the first three—which is the need to ensure *sustainability* or *sustainable growth*. Sustainability has deep roots in environmental history and has spread to economic development. We even find an "Office of Sustainability" in many organizations. What exactly is sustainability? How can we measure it? Are we on a sustainable path?

In his book *The Green Economy*, Michael Jacobs puts sustainability at the forefront of its principles. He views sustainability as about protecting the future since the interests of future generations are not represented today. He proposes two tests of sustainability to represent future interests. Here is his reasoning:[3]

> Imagine we were living in a hundred years' time. What would we want previous generations to have done with respect to the environment? Two intuitive answers spring to mind. . . . A "weak" version of sustainability would require that the environment is sustained only in the sense that future generations are guaranteed the avoidance of environmental catastrophe. By contrast, the "strong" or "maximal" version of sustainability would demand rather more: that future generations are left the opportunity to experience a level of environmental consumption at least equal to that of the present generation.

One point to recognize about Jacobs's exposition of Green economics is that sustainability expresses a narrow view of human concerns since it is primarily about the environment. In the weak version, society wants to avoid environmental catastrophe, which is hardly controversial, although we would want to avoid all catastrophes, including wars and pandemics. In the maximal version, society should guarantee environmental consumption, which would appear to prioritize environmental over other items of consumption.

As will appear below, the mainstream view of sustainability takes a completely different approach—that we should ensure future generations can have an overall standard of living at least as good as the current generation. The balance of this chapter develops this third view and its implications.

Sustainable Growth: The Origins

Concerns about sustainability arose more than a century ago with writings on forestry. One idea was that forests should be managed so they provide *maximum sustainable yield*, which is the maximum timber harvest that can be sustained indefinitely.

The concept of sustainability began with forests but has been extended to other natural resources. Other sectors include nonrenewable natural resources like energy, nonfuel minerals, and soils; renewable resources like fisheries and aquifers; and vital

environmental resources like clean air and water, the stock of genetic material, and our present climate.

The idea of sustainable growth was popularized in 1987 by the World Commission on Environment and Development (the Brundtland Commission):[4]

> Nature is bountiful, but it is also fragile and finely balanced. There are thresholds that cannot be crossed without endangering the basic integrity of the system. Today we are close to many of these thresholds; we must be ever mindful of the risk of endangering the survival of life on Earth.

Sustainable development was defined by the Brundtland Commission as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." It concluded that there "are environmental trends that threaten to radically alter the planet, that threaten the lives of many species upon it, including the human species."

Sustainability: The Economic Interpretation

How can we put the concept of sustainability into an economic framework? An illuminating analysis of sustainability was proposed by Robert Solow, the pioneer of economic-growth theory from the Massachusetts Institute of Technology (MIT). Solow's approach was to treat sustainability as a form of intergenerational egalitarianism, as he states here:[5]

> I will assume that a sustainable path for the national economy is one that allows every future generation the option of being as well off as its predecessors. The duty imposed by sustainability is to bequeath to posterity not any particular thing . . . but rather to endow them with whatever it takes to achieve a standard of living at least as good as our own and to look after their next generation similarly. We are not to consume humanity's capital, in the broadest sense.

In other words, sustainability means that this generation may consume its natural and produced endowments as long as future

generations can also enjoy a standard of living at least as good as the current generation.[6]

The Solow sustainability criterion raises three questions: First, what are living standards? Second, what are the prospects of future generations being better off than the present? Third, what are the major threats to future well-being, and, particularly, do they come primarily from the degradation of the environment and natural resources or from other areas?

The first question involves what we are actually sustaining. The mainstream economic approach is to assume that the proper perspective is the level of consumption that individuals desire and enjoy, or what philosophers call the individualistic perspective. We should not substitute our tastes for those of the population. Rather, social conditions should be judged based on how they are ranked by members of a society.

Also, consumption should be interpreted in a broad way—it should include not only standard items such as food and shelter but also services and intangibles such as culture, leisure, and the pleasure of nature hikes. Some items of broad consumption, such as nature hikes, are omitted from conventional measures of national output because they occur outside of the marketplace. Moreover, standard measures have some important deficiencies, such as the omission of health status and many intangible investments. But items included in standard measures of national output are important and well measured, so standard metrics provide an important and objective measure of living standards.

Taking the second question, what are the prospects for economic growth over the coming decades? A starting point is to look at economic history. Economic historians estimate that global per capita real output has grown at about 2.2% per year since 1900. Until the sharp, pandemic-induced downturn in 2020, global growth over the last two decades was above the historical average.

It would require a major discontinuity for growth to turn negative for a substantial period. True, the world economy has definitely taken a hit during the COVID-19 pandemic. But expert forecasters indicate that, after what might be a prolonged downturn, the

economy will eventually recover to its normal growth rate (although eventually might be many years).[7]

What are future prospects? A team of economists led by Peter Christensen used two techniques to estimate the expected economic growth rate of conventionally measured gross domestic product (GDP) over the period to 2100. One was a statistical procedure, and the second was a survey of experts. The two approaches yielded estimates of global per capita output growth of slightly above 2% per year over the 21st century. A striking feature of this study is that the two approaches, completely different in their methods, provided similar projections of future growth.[8] So the summary on the second question is that it seems likely that future generations will be better off than the present generation using standard measures of living standards.[9]

Third, how likely is a decline in future living standards? This would respond to what Jacobs called the "minimal" test for sustainability that refers to potential catastrophic downturns. The experts in the Christensen survey assessed that there is about a 5% probability that the growth rate to 2100 will be negative—in other words, that people living in 2100 will be worse off than those living in 2010. The statistical technique projected an even lower chance of economic decline.

The survey also asked experts to identify the threats to future economic growth. Four respondents believed that wars would be the largest threat, while one believed that catastrophic climate change would be the cause. Surprisingly, not a single one of the experts mentioned pandemics as a major threat to the future economy.

So, on the third question, both statistical techniques and experts find that the chances of economic decline during this century are very slim. But experts cannot accurately predict the known unknowns and can hardly be expected to foresee the unknown unknowns, so we must take these projections with caution.

Components of Sustainability

The major difference between Green economics and mainstream economics concerns the application of the sustainability concept. Green economics focuses on the central importance of environmental

consumption, while mainstream economics assumes that a broad bundle of goods and services—nonenvironmental as well as environmental—is the goal of economic activity.

To begin with, mainstream economics assesses the sustainability of a *broad* range of assets and a *rich* array of consumption goods and services. This approach allows the substitution of more abundant assets and goods for those becoming scarcer. Robert Solow put the point this way:[10]

> It makes perfectly good sense to insist that certain unique and irreplaceable assets should be preserved for their own sake, Yosemite [for example]. But that sort of situation cannot be universalized: it would be neither possible nor desirable to "leave the world as we found it" in every particular. Most routine natural resources are desirable for what they do, not for what they are. It is their capacity to provide usable goods and services that we value.

The tendency of consumers to find less expensive ways of satisfying their needs is the fundamental principle of *substitution*. Substitution occurs when needs are met by substituting goods that have declining prices and higher quality for those with rising prices and stagnant quality. Economic history is a book with many chapters on new technologies that led to the substitution of new, higher quality, and less expensive goods and services. There are chapters describing air travel replacing trains, which in turn outperformed stagecoaches, toilets ousting outhouses, cell phones substituting for landlines, and emails outpacing postal letters. We can reasonably ask whether the principle of consumption substitution applies everywhere. Are some elements of consumption sacred and inviolable?

We see no clear answers here, and indeed the answers are evolving over time. Most people would agree that societies should protect certain unique and irreplaceable assets (like Yosemite) as well as religious or cultural items (such as sacred temples). In the United States, free speech, the right to a trial, and the right to vote are inviolable principles, at least in principle. We cannot sell ourselves into slavery, even when we are in the most desperate situation. No one but the most extreme market fundamentalist would want to auction

Yosemite for mining development or sell New York's Central Park for a city of Trump Towers.

But other items are not inviolable. For conceptual clarity, let us call goods without sacred or inviolable elements *pure economic goods*. The major point, as Solow explained, is that sustainability does not require preserving pure economic goods for future generations. Prior generations had no obligation to this generation to maintain a minimum supply of outhouses or stagecoaches or kerosene lamps when cheaper and more desirable substitutes became available.

Similarly, we have no obligation to future generations to provide a minimum quantity of toilets or automobiles or bulky laptop computers. Sustainability requires adequate food, shelter, and health care. It does not require that houses be built from trees rather than synthetic materials, or that we eat wild rather than farmed fish, or that we live in small houses and drive big cars rather than live in large houses and drive small cars.

However, the stance of Green economics as represented by Jacobs is that certain environmental activities and assets are inviolable rather than pure economic goods. It is not, in that view, acceptable to provide a lower quality of environmental services so that people can enjoy a greater amount of nonenvironmental goods and services. For example, a biocentric viewpoint might hold the existence of major species to be beyond economic trade-offs. Or perhaps the existence and future enjoyment of pristine forests should not be sacrificed for normal goods.

Is there a role for red lines, for inviolable standards, here? And if so, where is the line? I would respond that we need to be cautious in drawing reds lines for social decisions and elevating some activities to the status of absolute necessities. We should always ask whether the environmental goals are valued for what they do or what they are.

Here are some areas where there is a lively debate about where to draw the red line. Two important areas are species survival and preventing climate change. I would argue that societies cannot escape from weighing costs and benefits, even if we would like to draw red lines to simplify decisions. Similarly, there is no bright line on how much pollution to allow or where the boundaries of protected

lands should be placed. The dilemma in a pandemic—how much to shut down society to reduce infections versus open up to reduce unemployment—is an unavoidable choice. For those situations, the ethical dilemmas we face generate fierce and genuine differences of approaches that cannot be finally resolved by religion, environmentalism, science, or economics.

A Parting Vision

We cannot end a discussion of sustainability without asking, sustainability for what and for whom? For this, we turn to Columbia University's Jeffrey Sachs. More than any single person today, Sachs has been a brilliant and tireless scholar-activist for sustainable development informed by the best economic and environmental thinking. He summarizes his vision as follows:[11]

> The fact of the matter is that humanity is still rushing headlong towards multiple collisions with nature and with each other, within highly divided and unfair societies. And yet, we have the means to succeed; that is, to combine the end of poverty with social inclusion and environmental safety. The most essential quality for our survival will be a shared moral impulse to do the right thing: to protect each other and nature from our greed, scientific lack of understanding, and moral disregard and carelessness.

Sachs's summary of sustainable development, and his warning about collisions with nature, parallels the conclusions of this book as well.