



Traditional measurements of performance, such as gross domestic product (GDP), account for economic development but do not accurately reflect human or environmental well-being. Since the 1990s several new metrics have been proposed, including green GDP, which attempts to provide a more accurate accounting that considers both the positive transactions that benefit well-being and the negative economic activities that diminish it.

The concept of “green GDP” arose in the early 1990s in reaction to the deficiencies of the traditional gross domestic product (GDP) to account for the economic costs of depleted natural resources and incurred pollution, which in turn affect human welfare. GDP is usually defined as the total market value of all final goods and services produced within a territory in a given period of time (usually a year), including exports minus imports (net exports). It has been used as a standard measure of the size of an economy in national accounting and is often mistakenly regarded as a proxy for progress in the public discourse. A closely related term is *gross national product* (GNP), which is GDP plus international income transfers. The term *gross* means the exclusion of capital depreciation from the accounting. Infrastructural wear and tear, for instance, do not make their way into the GDP. When such considerations are taken into account, *net domestic product* (NDP) and *net national product* (NNP) are used.

Limits of Traditional GDP

Ecosystem services such as climate regulation, carbon sequestration, and nutrient cycling, while indispensable for human survival, are not part of traditional economic accounting. Some have estimated the economic value of

the world’s ecosystem services to be US\$33 trillion per year on average, mostly outside the market and almost twice as much as the global GDP total (Costanza et al. 1997). Valuing ecosystem services, however, has been controversial to some economists and ecologists for methodological and other reasons. GDP omits many of the important goods and services that we derive from nature because its scope is delimited completely by the market. Thus, despite its prominent position in economic analysis and public policy, GDP has become the target of increasing criticism in recent decades. In GDP accounting, no distinction is made between activities that contribute to well-being and those that detract from it. A classic example is an oil spill, which is counted as a positive addition to the GDP because it warrants expenditure on cleanup. In this way, many environmental damages are vindicated as contributions to economic progress. For the environmentally conscious, this is an affront to both intuition and ethics as pollution (especially of such a magnitude) is detrimental to both human and environmental health.

Also, GDP does a poor job of reflecting actual human well-being because it neither accounts for social sustainability nor future consequences of present consumptions. In fact, recent studies suggest that, for a number of countries, the positive correlation between human well-being and GDP breaks down after GDP values reach a certain threshold—known as the “threshold hypothesis” (Max-Neef 1995). A rising GDP merely signals an increasing level of market transactions, without regard for whether these activities are beneficial to humans and nature in the long run. Thus, a fixation on the temporally narrow scope of traditional economic accounting can lead to dangerously myopic policies. The absence of ecosystem services and environmental damages (known



as “externalities” in economic parlance) from monetary valuation potentiates the vicious cycle of economic shortsightedness and environmental misuse. It is widely accepted now that GDP significantly undervalues the contributions of nature to human well-being and is ill-suited for measuring sustainable development. Green GDP (also green NNP), therefore, has been proposed to explicitly estimate these missing costs by subtracting the economic penalties imposed by natural resource depletion and pollution from national accounting. As a result, the green GDP is meant to advance a more inclusive view of “natural capital” and promote more sustainable management practices.

Alternatives to GDP

The notion of “greening” GDP has gained some momentum in both academia and public policy since the early 1990s. One of the most noteworthy attempts to implement the concept was carried out by the People’s Republic of China. In 2006, the Chinese government released its environmentally adjusted GDP—its green GDP, prepared jointly by the State Environmental Protection Agency and the National Bureau of Statistics (SEPA and NBS 2006). Included in the calculation were assessments of air, water, and solid-waste pollution as well as the costs of depleting various natural resources. The report concluded that the economic loss of environmental damages amounted to 3 percent of the country’s GDP in 2004. Nearly as soon as the figures were released, however, it became clear that there still remained major defects in the accounting procedures. A large number of concerns were not factored into the analysis, and there were also myriad methodological obstacles that impeded a thorough economic analysis of environmental damages. For instance, only half of potentially more than twenty pollution costs were estimated in

China’s green GDP report.

Concerns such as soil and groundwater contamination, as well as the entire categories of natural resource depletion and ecological damage, were not included in the

accounting. Thus, the 3 percent

diminution fell short of what many analysts

believed the actual costs were. It is now evident that green GDP, for China and elsewhere, is still theoretically appealing but practically formidable.

In addition, several other development metrics similar to green GDP have also been developed as a part of a larger group of sustainable development indicators. For example, the Index of Sustainable Economic Welfare (ISEW)

was developed in the late 1980s to address the flaws in GDP. ISEW accounts for both conventional economic transactions and nonmarket natural and social benefits, and its value is determined by the balance between positive transactions that benefit human well-being and negative economic activities that diminish it. Genuine Progress Indicator (GPI), developed later in 1994 by Redefining Progress (a nongovernmental organization focused on public policy), includes essentially the same measures as ISEW. The main differences between the two are related mostly to data availability and users’ preferences for valuation methods. ISEW and GPI have widely been used by international organizations, governmental agencies, and academic researchers. Another common development metric is Genuine Savings (GS), proposed by the World Bank in 1999. Taking into account both natural and human capital, GS estimates the domestic savings less the value of resource depletion and environmental degradation. A relatively new metric, Happy Planet Index (HPI), was introduced by the New Economics Foundation (NEF) in 2006. HPI bypasses traditional monetary approaches and focuses on the efficiency with which countries translate natural resource use into human and societal well-being. Specifically, HPI is the ratio of happy life years (the product of life satisfaction and life expectancy) to environmental impact (measured by ecological footprint).

The Future of Green GDP

Despite the mounting criticisms of its irrelevance and the emergence of alternatives, GDP’s deeply entrenched position in the mainstream discourse will likely ensure its continued prominence in both economics and public perception. It is important, therefore, to clearly understand what GDP measures and what it does not. Meanwhile, efforts for valuating the depletion of natural resources and the impacts and mitigations of pollution will continue. The environment must be part of national accounting. The United Nations has published a set of accounting guidelines in the *Handbook of National Accounting: Integrated Environmental and Economic Accounting* (known as SEEA 1993 and SEEA 2003), which provide a common framework for valuating environmental contributions to economies and economic impacts on the environment. Such efforts promote methodological standardization that in turn facilitates applications and cross-country comparisons. They also represent a continued operationalization (the process of strictly defining variables into measurable factors) of the ideas behind green GDP. Although it remains implausible that GDP will soon be displaced as the hallmark indicator of economic fitness, attempts to “green” it, despite various shortcomings, constitute a positive movement in the direction of environmental consciousness. Complementary



indicators and indices are also needed if we are to adequately measure our true economic wealth and health: the sustainability of human–environmental systems.

Jianguo WU
Arizona State University

Tong WU
Northern Arizona University

See also Development, Sustainable; Ecological Economics; Ecosystem Services; Natural Capitalism; True Cost Economics

FURTHER READING

Abdallah, Saamah; Thompson, Sam; Michaelson, Juliet; Marks, Nic; Steuer, Nicola; & New Economics Foundation. (2009). *The happy planet index 2.0: Why good lives don't have to cost the Earth*. Retrieved October 1, 2009, from <http://www.happyplanetindex.org/public-data/files/happy-planet-index-2-0.pdf>

- Boyd, James. (2007). Nonmarket benefits of nature: What should be counted in green GDP? *Ecological Economics* 61(4), 716–723.
- Cobb, Clifford; Goodman, Gary Sue; & Wackernagel, Mathis. (1999, November). *Why bigger isn't better: The genuine progress indicator—1999 update*. Retrieved October 1, 2009, from <http://www.rprogress.org/publications/1999/gpi1999.pdf>
- Costanza, Robert, et al. (1997). The value of the world's ecosystem services and natural capital. *Nature*, 387, 253–260.
- Costanza, Robert. (2008). Stewardship for a “full” world. *Current History*, 107(705), 30–35.
- Max-Neef, Manfred. (1995). Economic growth and quality of life. *Ecological Economics* 15(2), 115–118.
- Qiu, Jane. (2007, August 2). China's green accounting system on shaky ground. *Nature*, 448, 518–519.
- State Environmental Protection Administration of China (SEPA) and the National Bureau of Statistics of China (NBS). (2006). China's green national accounting study report 2004. Retrieved November 25, 2009, from http://www.gov.cn/english/2006-09/11/content_384596.htm
- United Nations; European Commission; International Monetary Fund; Organisation for Economic Co-operation and Development; & World Bank. (2003). *Handbook of national accounting: Integrated environmental and economic accounting 2003*. Retrieved August 11, 2009, from <http://unstats.un.org/unsd/envaccounting/seea2003.pdf>



Share the *Encyclopedia of Sustainability*: Teachers are welcome to make up to ten (10) copies of no more than two (2) articles for distribution in a single course or program. For further permissions, please visit www.copyright.com or contact: info@berkshirepublishing.com  [Get Permissions](#)