

The Political Economy of Greening the National Income Accounts

by Gernot Wagner*

While the United Nations and many other countries are actively exploring green accounting, official efforts in the United States have come to a virtual halt. In 1994, Congress commissioned a high-level study reviewing the Bureau of Economic Analysis's (BEA) work on its Integrated System of Environmental and Economic Accounts (ISEEA), but since its publication in 1999 has ignored the results and continued to bar BEA from its efforts. The debate surrounding green accounting in the U.S. should be freed from the partisan struggle in Washington and moved in the hands of the scientific community. Green accounting efforts should seriously focus on including ecological services as well as mere resource depreciation, but in line with the recommendations of Nordhaus and Kokkelenberg (1999), the existing national income and product accounts framework should be used as a point of departure, and the creation of official accounts should employ an incremental approach, giving first priority to areas where the necessary research is available.

History of Green Accounting in the U.S.

In 1989, Repetto *et al.* (1989) drew considerable attention to the shortcomings of economic indicators in a report entitled *Wasting Assets*. Using Indonesia as a case study, it concluded that the country's reported economic growth throughout the 1970s and 80s would be cut in half if GDP calculations were modified to a so-called "Net" Domestic Product, taking timber, oil, and soil depletion into account. This World Resource Institute study was by no means the first to point out major shortcomings in national income measurements, but it sparked a considerable debate about "green accounting"—integrating environmental and economic accounts.¹ At that time, the U.N. Statistical Office was working in cooperation with several other international institutes and expert groups to amend its System of National Accounts (SNA) for publication in 1993, the

first major revision in almost three decades. The 1993 revision did not include guidelines for an integrated system of environmental and economic accounts, but in the appendix suggested the use of so-called "satellite accounts" for environmental statistics. Such a system leaves the core economic accounts untouched while providing some environmental information in a compatible, yet not fully integrated, set of supplementary statistics (SNA 1993: chapter XXI). In addition, the U.N. (1993) published a handbook on the system of integrated environmental and economic accounting (SEEA), with the goal of guiding national accountants in their efforts to create physical and monetary environmental statistics.

BEA is implementing the recommendations presented in the SNA with some modifications in its National Income and Product Accounts (NIPA). Even before the publication of the U.N. handbook, it had started to compile its own version of Integrated Environmental and Economic Satellite Accounts (IEESA) in 1992, following a recommendation of the Council of Economic Advisers under President Bush.² Two years later, BEA (1994) presented initial findings in its monthly *Survey of Current Business*. The issue included an overview of its efforts, as well as guidelines for the future and preliminary estimates for mineral resources. With the 1995 Appropriations Bill, however, the 103rd Congress stopped BEA's work on all environmental accounts. In response to this order, the Department of Commerce, of which BEA is a part, asked the National Academy of Sciences (NAS) to review the current state of environmental accounting in the U.S. (U.S. Congress, 1994). In 1999, a commission of leading environmental economists and national income statisticians published *Nature's Numbers*, which analyzed the state of green accounting in the U.S. and prospects for future work (Nordhaus and Kokkelenberg, 1999). The study concluded that extensive research is still needed for developing a consistent set of accounts, but that "the rationale for augmented accounts is solidly grounded in mainstream economic analysis" and that BEA's work on IEESA is the best place for this research. So far, however, Congress has given BEA no mandate to continue its work on environmental accounts.

Politics of Green Accounting

Throughout the last decade, the issue of green accounting has been highly polarized. The political

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¹ For earlier critiques of the national income accounts, see Nordhaus and Tobin (1972) and Eisner (1988), among others.

² Earlier calls for environmental accounting in the U.S. reach back even further. The Ford Administration was the first to call for environmental accounting to track capital investment expenditures on pollution abatement, an initiative supported by President Carter (Nordhaus and Kokkelenberg (1999), p. 154).

debate splits along party lines: generally speaking, Democrats have favored environmental accounting, while Republicans have opposed it. In *Earth in the Balance*, Vice President Al Gore (1992) called for a full integration of environmental and economic accounts, even though he acknowledged that national accountants did not believe this was feasible given the state of knowledge at the time.

President Clinton also addressed the importance of environmental accounting in his 1993 Earth Day address. Following the publication of the NAS study *Nature's Numbers*, the 2000 Economic Report of the President included an entire chapter on "Making Markets work for the Environment," which contains a discussion entitled "Taking Account of the Environment." In this section, the President's economic advisors stressed the lack of "a coherent framework for accounting for environmental quality and natural resource use in tandem with market economic activity" and referred to the recommendations presented in *Nature's Numbers*. They urged the creation of supplementary accounts for "assets and production activities associated with natural resources and the environment." The conclusion specifically states that integrated environmental and economic accounts do not merely contribute to the understanding of societal welfare or human development but to the nation's economic development ("Economic Report of the President," 2000). Consistent with the platform of the Clinton administration, congressional Democrats have also been in favor of green accounting.

One notable exception in this support, however, was the decision of the 103rd Congress to stop funding for BEA's green accounting activities. Alan B. Mollohan, a Democratic House Representative from West Virginia and a longstanding member of the Appropriations Subcommittee responsible for allocating funds to the departments of Commerce, Justice and State, sponsored the bill (U.S. Congress, 1994). This is not surprising, considering that he represented a district in West Virginia's coal country. The National Mining Association indicated it did not actively lobby on the issue, but it did express support of Representative Mollohan's action.³ Mining corporations are afraid of being marginalized by a reform of the SNA and that instead of producing tangible wealth, their activities would be viewed as depleting one form of (natural) wealth and creating other forms of (human-made) wealth—a potential blow to their public image. Despite calls from economists and national

³ According to Connie Holmes, Vice President of Policy of the National Mining Association, formerly known as the National Coal Association (phone conversation on January 30, 2001).

income accountants negating this claim, it was used as one of the arguments in support of Congress's decision to stop BEA's activities, which overshadowed the fact that the stop had its scientific merits. Similarly to the development of NIPA in the early parts of the last century, green accounting is a highly contentious field with many methodological problems. Moving the discussion from BEA to an independent scientific panel was an important step to reexamine the underlying issues. However, now that the findings have been published, Congress should again give BEA the opportunity to continue its research.

Congress commissioned the NAS study when stopping BEA's efforts, but the publication of *Nature's Numbers* has been ignored.⁴ This is not surprising to political scientists, who would be hard pressed to cite an example of when an NAS report triggered direct political action. Members of Congress answer to their constituents, not to scientific panels, unless it is politically expedient. The main ideological argument on the side of Republican lawmakers is that integrating environmental statistics into economic data would give what some might consider 'environmentalist ideas' too much weight in economic decision making. Instead of being based purely on intangible values and quality of life factors that are virtually impossible to measure, an integration of environmental and economic accounts would give these ideas real dollar values, providing quantifiable data and therefore rendering them comparable to other policy decisions.

Ironically, Republicans are in favor of benefit cost analyses while Democrats generally oppose it. However, this division is reversed when it comes to taking account of ecological services. One example is the debate of mechanical treatment versus controlled burning in forest management.⁵ Republicans, backed by the forest industry, favor mechanical treatment, while Democrats, catering to greens, prefer controlled burnings. However, the two parties support their positions with entirely different sets of facts. The Republican arguments for mechanical treatment are largely backed by hard economic data such as the number of jobs created in the logging industry. Democratic arguments for controlled burns, however, are to a large extent based on "soft" data such as increased ecological value. Assigning a dollar value to the ecological services a healthy forest provides,

⁴ After the 103rd Congress halted BEA's work, every successive house report to the annual Appropriations Bill included a passage barring BEA from its work on the IEESA.

⁵ See Bennett (2000) and Udall (2000) for a more complete discussion of this issue.

would put the argument for burning on equal footing with the economic arguments favored by Republicans. It is not surprising that the GOP would therefore oppose any such attempts to integrate environmental and economic accounts.

The debate of whether or not to go ahead with green accounting in the U.S., however, should rise above party politics. As Nordhaus and Kokkelenberg (1999) concludes, “a set of comprehensive accounts would illuminate a wide variety of issues concerning the economic state of the nation” (p. 158). Many theoretical and methodological issues have yet to be resolved, but this should be reason for an expansive research agenda, not for a stop of BEA’s efforts.

The public debate in green accounting is currently dominated by the emerging field of ecological economics. Costanza *et al.* (1997a) attempted to evaluate the entire globe’s environmental services drew considerable public attention. There is definitely some merit in this work for the environmental community, but such numbers have very limited value for economic policy in the U.S.⁶ Rather than estimating total “Green GDP,” analysts who aim to influence policy should focus on specific environmental values in the form of satellite accounts. Research efforts should focus on smaller aspects of green accounting that correspond to clear policy questions. The debate surrounding prescribed burning versus mechanical treatment, for instance, could be considerably improved by means of U.S. forest satellite accounts. Similarly, such accounts could aid in the policy analysis of the Forest Service’s Roadless Area Conservation initiative.

Application to Forestry

Nature’s Numbers also identified the refinement of timber value estimates as a next logical step in the implementation of the IEESA, and offered concrete suggestions. In its previous estimates, BEA used a shortcut approach similar to Repetto *et al.*’s method in *Wasting Assets* which is theoretically incorrect and, in practice, can vastly overestimate actual timber values.⁷ Nordhaus

⁶ See Bockstael *et al.* (2000) for a comprehensive critique of Costanza *et al.*’s work, as well as Daily *et al.* (1999) for further explorations of the underlying issues.

⁷ Under idealized conditions of a single, managed forest stand in perfect rotation sustaining its annual harvest at a constant rate into perpetuity, the Repetto method underestimates the actual timber value, since it ignores future timber growth and undervalues all tree stands up to the optimal rotation age. Since in most countries only a fraction of the total forest area is

et al. propose an alternative method for timber evaluation based on an unpublished manuscript which has been further developed by Jeffrey Vincent (1999). *Nature’s Numbers* erroneously states that the present discounted value (PDV) method, which calculates the current value $V(t)$ as the sum of discounted future income streams, harvest rate $q(t)$ times stumpage value $p_s(t)$, to yield

$$V(t) = \sum_{t=0}^T \frac{p_s(t)q(t)}{(1+r)^t},$$

is only theoretically correct for the case of “timber mining” of old-growth forests (Nordhaus and Kokkelenberg, 1999: p. 137–8.). The study then suggests the use of Vincent’s method for managed second-growth forests. However, Vincent’s approach is derived from this PDV method. Assuming T equal infinity, the PDV method correctly depicts the timber-value for any forest type—regardless of whether it is an old-growth or managed second-growth forest. Vincent’s method still has the significant advantage that under certain conditions, it is easier to use current data, rather than future projections, which are required for the PDV approach. Nevertheless, the quality of physical forest data in the U.S. does not allow the Vincent method to be used to calculate precise results due to its particular sensitivity to fluctuations in forest area estimates. It is easier to obtain future projections of quantity and price paths than accurate current area data. Considering these caveats, it is relatively straightforward to calculate a theoretically correct set of timber values using the standard PDV approach in conjunction with projections based on already existing physical timber models (Wagner 2001).

Accounting for Ecological Services

Timber-values, however, are only part of the picture. Nontimber values arguably constitute a much larger fraction of the total forest value. Considering the functions of watershed protection, prevention of soil erosion and the provision of wildlife habitats, as well as use and existence values, estimates of nontimber values are of crucial importance for policy evaluations, as in the case of prescribed burnings versus mechanical treatment, or the Roadless Area Conservation initiative. While the theory for including timber values is relatively well developed, the rationale behind including other ecological values has been less investigated. Even the question of whether or not to account for these services is a contentious issue. The ecological economics argument is based on the idea that we should focus on total societal welfare instead of economic welfare, and that human

optimally managed and old-growth forests are considerably overvalued, in practice, the Repetto method overestimates the actual timber value.

society is an integral part of the natural world.⁸ This criticism of neo-classical economics has its validity, but the answers provided are still inherently flawed and impractical. Our national income accounts have served us well in economic policy decisions, and currently practical solutions should focus on them as a point of departure.

In particular, one ought to start with the definition of what it is we are trying to measure. Martin Weitzman accomplished this for the case of the depreciation of natural resources in 1976.⁹ Weitzman's paper lends theoretical credibility to the creation of timber accounts, but it does not do the same for comprehensive forest accounts. A theoretical argument would have to follow the notion of expanding the production function itself to include ecological services and provide a credible relationship between timber extraction and decreases in services the forest is able to provide.¹⁰ Aggregated to a global scale, this calculation would evoke the same misleading notion criticized in Costanza *et al.*'s *Nature* article. This fallacy, however, can be avoided by applying the concept to a considerably smaller level, in this case, U.S. forests.

In contrast to timber accounts, which are theoretically well grounded, comprehensive forest satellite accounts would involve large uncertainties inherent in nonmarket valuation techniques. Nevertheless, attempts are being made to overcome these barriers.¹¹ In this regard, green accounting can also have a positive impact on the traditional nonmarket evaluation literature since it uses the same valuation methods.

Conclusion

Nature's Numbers makes clear that timber accounts illustrate an area appropriate for immediate implementation, even though the specific procedure cited should be questioned. It would be premature to fully integrate ecological services into a comprehensive set of forest accounts, but more research in this area would undoubtedly be of high value to both green accounting efforts and, to a lesser extent, also to the nonmarket valuation literature. There are clear economic policy arguments for integrating environmental and economic accounts. The fact that some tough theoretical questions must still be addressed should not deter from tackling the issue, but should rather act as a call for more funding and research. Whether and how to use the actual accounts in policy decisions will undoubtedly be a political issue, but the debate about creating the numbers in the first place should be moved from the political arena back to BEA and the economics community. Instructing BEA to resume work on a domestic green accounting system, in accord with the NAS recommendations, would be a first necessary step to do so.

⁸ Very accessible overviews of this issue can be found in *You can't eat GNP: economics as if ecology mattered* by Eric Davidson (2000) as well as in Jane Jacobs (2000). Costanza *et al.* (1997b) contains a comprehensive discussion of the ecological economics perspective.

⁹ Weitzman (1976) proves that including the net-depletion of subsoil assets in a comprehensive Green NNP measure sets it equal to the current sustainability equivalent of production, a notion which could equally well be applied to the depreciation of timber.

¹⁰ See Heal (1998) for a comprehensive treatment of this subject.

¹¹ Compare Adger *et al.* (1995) who created comprehensive forest accounts for Mexico.

References

- Adger, W. Neil *et al.* 1995. "Total economic value of forests in Mexico." *Ambio* 24 (5), August.
- Bennett, R. S. 2000. "Q: Should Congress Halt Commercial Logging in the National Forests?; No: If Timber Harvesting is Permitted, there Will be Less Need for Controlled Burns." News World Communications, Inc. 26 June.
- Bockstael, Nancy E. *et al.* 2000. "On Measuring Economic Values for Nature." *Environmental Science and Technology* 34 (8): 1384–1389.
- Bureau of Economic Analysis. 1994. "Integrated Economic and Environmental Satellite Accounts." *Survey of Current Business* April.
- Costanza, Robert *et al.* 1997a. "The value of the world's ecosystem services and natural capital." *Nature* 387, 15 May: 253–260.
- Costanza, Robert *et al.* 1997b. *An introduction to ecological economics*. International Society for Ecological Economics. Boca Raton, Fla.: St. Lucie Press: St. Lucie Press.
- Daily, Gretchen C. *et al.* 1999. "The value of nature and the nature of value." Beijer International Institute of Ecological Economics, Beijer Discussion Paper Series No. 126.
- "Economic Report of the President." 2000. Washington: U.S. Government Printing Office.
- Eisner, Robert. 1988. "Extended accounts for national income and product." *Journal of Economic Literature*. (December) 26: 1611–1694.
- Heal, Geoffrey. 1998. *Valuing the Future: Economic Theory and Sustainability*. Columbia University Press.
- Gore, Al. 1992. *Earth in the balance*. London: Earthscan Publications Ltd.
- Nordhaus, William D. and Edward C. Kokkelenberg (Eds.).1999. *Nature's numbers: expanding the national economic accounts to include the environment*. Washington, D.C.: National Academy Press.
- Nordhaus, William D. and James Tobin. 1972. "Is growth obsolete?" *Economic Growth*, 50th anniversary colloquium V. New York: Columbia University Press for the National Bureau of Economic Research.
- Repetto, Robert *et al.* 1989. *Wasting Assets: natural resources in the national income accounts*. Washington: World Resource Institute.
- System of National Accounts 1993 (SNA)*. 1993. Commission of the European Communities (Eurostat), International Monetary Fund (IMF), Organization of Economic Cooperation and Development (OECD), United Nations (U.N.), and World Bank. Brussels/Luxembourg, New York, Paris, Washington DC.
- Vincent, Jeffrey R. 1999. "Net Accumulation of Timber Resources." *Review of Income and Wealth* Series 45, Number 2: 251-262.
- Wagner, Gernot. 2001. "U.S. Timber Accounts, 1957–1997." Working Paper, Environmental Science and Public Policy 91r. Cambridge, Massachusetts: Harvard University. January 23.
- Weitzman, Martin L. 1976. "On the Welfare Significance of National Product in a Dynamic Economy." *Quarterly Journal of Economics*, 90 (1), February:156–162.
- Udall, S. L. 2000. "Let's Begin to Manage Our Forests." *The Arizona Republic*. 6 July.
- U.N. 1993. *Integrated Environmental and Economic Accounting*. U.N. New York, NY
- U.S. Congress. 1994. House Report Accompanying HR 4603, U.S. Department of Commerce, FY 1995, Public Law 103-317. Washington, D.C.