



“Summary of article by Carrie A. Meyer: Environmental and Natural Resource Accounting: Where To Begin?” in Frontier Issues in Economic Thought, Volume 3: Human Well-Being and Economic Goals. Island Press: Washington DC, 1997. pp. 365-369

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Accurate measurement of sustainable income is impossible without taking into account environmental factors, since the depletion and degradation of natural resources and the environment threatens future production and consumption. Policy-makers therefore need indicators that incorporate environmental assets and services in order to guide the allocation of resources for sustainable development. This article sorts through some of the confusion and controversy that surrounds environmental and natural resource accounting, analyzes some of the attempts to provide such indicators, and offers suggestions on how to adopt these new methodologies.

ISSUES IN ENVIRONMENTAL ACCOUNTING

The most glaring omission in national accounts is that of natural capital depreciation. Net Domestic Product (NDP) adjusts for manmade capital depreciation, but not natural capital depreciation. When natural assets are depleted, both the activity of extracting the resources and the value of these assets enter positively into Gross National Product (GNP). Natural resource accounting attempts to fill this gap, while environmental accounting encompasses a broader range of issues and more complex problems. Natural resource accounting takes the market value of the expended resource into account, while environmental accounting attempts to incorporate all of the nonmarketed services and benefits provided by the environment.

The practical difficulties of this task are enormous and the potential pitfalls many. For instance, the popular technique of contingent valuation (CV) has been criticized for being difficult to execute, expensive, and prone to exaggerated and unrealistic estimates. Thus, consensus seems to be that pure valuation methodologies, such as CV, should be avoided if there is more readily available and reliable data. Valuation techniques aside, there exists the fundamental problem of delineating the boundary of "natural productive capital". Most would agree that timber and mineral resources should be included, but there remains uncertainty over whether to include the depreciation of air, soil, and water resources. "As the line between resource depletion and changes in non-marketed environmental services begins to blur, the controversy increases." [4]

Another conceptual problem that arises when trying to create a true measure of sustainable income is that physical depreciation of natural capital does not necessarily imply an economic depreciation or vice versa. Natural capital revenues can be invested in manmade capital or human capital. In this case, we would have physical depreciation, but not economic

depreciation. However, natural and human capital are not substitutable forever. At some point environmental degradation threatens our very survival.

REVISING EXISTING SYSTEMS OF NATIONAL ACCOUNTS

The United Nations System of National Accounts (UNSNA), provides a standard to which most countries adhere closely. While this approach includes a system of balance sheets to calculate the total assets of a country, the core income and product accounts do not treat natural capital as an asset. The absence of natural capital in these figures may be attributed to the relative abundance of natural resources as compared to population size and the types of economic activities that existed fifty years ago, when national income accounts were first established.

The United Nations has been actively seeking alternatives to the current system. One effort resulted in the Handbook of Integrated Environmental and Economic Accounting,¹ which provides guidelines for satellite integrated environmental and economic accounts. These satellite accounts are fully compatible with core accounts. Adjustments to core accounts have been made with an eye toward the eventual incorporation of environmental accounting. Nevertheless, the Handbook falls short of advocating a standard model for environmental accounting, leaving countries to decide which approach, if any, to adopt until international consensus is reached.

Accounting methods offered by the United Nations and some others, such as the system developed by Henry Peskin,² aim to develop comprehensive approaches for full environmental accounting. If successful, full environmental accounting would greatly increase the information available to policy-makers. While some countries have made small adjustments to their national accounts, no country has yet overhauled its system to make it entirely environmentally inclusive. This is understandable when considering the enormous technical and political undertaking involved. Furthermore, no country would want to make radical changes in its system without the endorsement of the UNSNA since such an act would be contrary to the intent of a unified system.

NATURAL RESOURCE ACCOUNTING CASE STUDIES

A number of pioneering empirical studies have provided guidance and set precedents for environmental accounting. Rather than attempting to construct complete environmental accounts, these case studies have generally focused more specifically on measurement of natural resource depletion. Natural resource accounting case studies of Indonesia and Costa Rica by researchers working with the World Resources Institute, using methodology consistent with the UN guidelines, have concentrated on a few principal natural assets -- forests, soils, significant minerals, water, and fisheries -- to calculate a measure of NDP adjusted for natural resource depletion.³ The results for both countries showed that the depreciation of natural capital was quite large, resulting in significant alterations to estimated growth rates and investment levels.

Case studies of Mexico and Papua New Guinea been prepared under U.N. auspices, using the proposed U.N. framework for integrated environmental and economic accounting.⁴ In contrast to the WRI studies, which use resource depletion estimates to adjust NDP, the U.N. work emphasizes the expansions of existing national accounts to include environmental information.

This included estimates of the value of environmental services as well as assets. They calculated two adjusted NDP values, one accounting for resource depletion only (EDP1) and a second including both resource depletion and resource degradation (EDP2). The results for Mexico in 1985 showed a divergence of 13.3% from standard GDP for EDP1 and 17.7% for EDP2. The results for investment estimates are even more striking: net investment is cut by 50% in EDP1, and by more than 100% in EDP2 (i.e. net investment becomes negative when resource depletion and degradation are taken into account). For Papua New Guinea over the period 1985-1990, EDP1 varied from 1% to 8% below standard GDP, while EDP2 was from 3% to 10% below standard GDP.

THE FUTURE OF ENVIRONMENTAL ACCOUNTING

Given the many conceptual problems of developing an indicator that accurately reflects sustainable income, is it even worthwhile to start making such adjustments? Some caution that environmental accounts may run the risk of encouraging a false sense of policy security, especially when using methods that only account for resource depletion. Others claim that such approaches will have little significance in industrialized countries where environmental problems are focused on pollution, and resource depletion is overwhelmed by production in various economic sectors.

Given the huge costs of overhauling an entire accounting system, is this comprehensive approach the most cost-effective way to improve environmental management? "Without doubt, even back-of-the-envelope calculations of natural resource depletion help to put resource use in perspective, and when major increases in GDP reflect nothing more than the consumption of natural capital, policy-makers should know." [2] Sectoral approaches that are certainly less data intensive may also be more cost-effective in the long-run.

WHERE TO BEGIN

Efforts to change accounting structures should be driven by the information needs of policy-makers. They are only useful to the extent that they can improve economic and environmental policy, and their implementation depends on their acceptance into the political system. Good communication about the policy utility of environmental and resource accounting is vital to this acceptance, as is the credibility of the proposed methodology. "There is no single recipe for how to establish credibility and achieve consensus. Beginnings can be made by bringing people together from different institutions; obtaining the UN Handbook of Integrated Environmental and Economic Accounting; establishing international links with organizations, individuals, and governments developing environmental and resource accounts; focusing first on resource depletion (especially in developing countries); initiating case study research efforts; or gathering data." [15]

"Altering the world's accounting systems to account for the depreciation of our natural assets and to better reflect sustainable income will take considerable time, effort, and money. It won't happen overnight. But, by taking deliberate steps from many angles toward that end, we can begin to bring the costs and benefits of changes in the environment to the attention of policy-makers and to improve our ability to plan for a more sustainable future." [17]

Notes

1. United Nations Department for Economic and Social Information and Policy Analysis, Statistical Division, Integrated Environmental and Economic Accounting (New York, 1993: United Nations, Handbook of National Accounting, Series F, No. 61)
2. Henry M. Peskin, "Alternative Environmental and Resource Accounting Approaches," in Robert Costanza ed., Ecological Economics: The Science and Management of Sustainability (New York: Columbia University Press, 1991, pp. 176-193); also Henry M. Peskin, "A National Accounting Framework for Environmental Assets," Journal of Environmental Economics and Management 2 (1976), pp. 255-262
3. Robert Repetto et al., Wasting Assets: Natural Resources in the National Income Accounts (Washington, D.C.: World Resources Institute, 1989); Tropical Science Center and World Resources Institute, Accounts Overdue: Natural Resource Depreciation in Costa Rica (Washington, D.C.: World Resources Institute, 1991).
4. Jan van Tongeren et al., "Integrated Environmental and Economic Accounting: A Case Study for Mexico," and Peter Bartelmus et al., "Integrated Environmental and Economic Accounting: A Case Study for Papua New Guinea," in Ernst Lutz ed., Toward Improved Accounting for the Environment: An UNSTAT-World Bank Symposium (Washington, D.C.: World Bank, 1993).