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Green Accounting: what? Why? Where we are now and where we are heading - A Closer Look

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Abstract
Awareness of environmental limits has led to a proliferation of accounting methodologies designed to measure the impact of human activity on the earth's ecological systems and resources. Such methodologies can be collectively described as green accounting, and categorised in three different ways; first, by whose actions are being accounted for; second, by the time period being considered; third, by how environment impacts are measured. Current practice tends to focus on parallel reporting with financial accounting still having greater importance. Green accounting remains largely voluntary and unaudited. The key challenges for green accounting can be summarised as first to determining the scale of change in human activity required to prevent environmental degradation and incorporating some reference to these limits within its metrics, and second to be effective in prompting the necessary behavioral change within the necessary timescale.

Key Words: Green accounting; alternative indicators; environmental indicators; sustainability reporting; behavioral change.

01. Introduction

Environmental accounting is supposed to address such crises in two ways. First, it makes environmental crises more visible to decision-makers, by classifying them in a way that makes explicit pre-existing equivalences or quantifiable relationships with commodities and other economic objects. Coding the statement ‘we must pay more attention to the environment’ as ‘we must calculate the value of the environment’, it provides a ‘guide to analysis and a language of debate’ (Porter, 1995, p. 86) that enables decision makers to trade one thing off for another more confidently by providing ‘a clearer sense of the stakes’ (Sunstein, 2005, p. 129). Second, environmental accounting helps transform environmental objects into commercial ‘goods and services’ whose value can be ‘discovered’ in market themselves. Trade itself becomes comparative valuation and environmentalist action.

Like most received opinion, the view expressed by Al Gore has attracted its share of standard critiques. One of the most important is articulated in the epigraph from O’Neill. This is that the problem has been mistaken for the solution. Environmental crises are rooted not in inadequate costing, insufficient commoditization or incomplete accounting, ‘but in the very spread of market mechanisms and norms’ into putative non-market spheres of society or nature (O’Neill, 2007, p. 21). Environmental accounting, on this view, does not reveal what has previously been only implicit, but rather misrepresents, and thereby endangers, a ‘“free” unpriced world of knowledge, the body and so on’ (O’Neill, 1997, p. 550). ‘Protection of our environment is best

served, not by bringing the environment into a surrogate version of the commercial world, but by its protection as a sphere outside the world of commodity exchange and its norms' (O'Neill, 1997, p. 550).

As often happens, received wisdom and standard critique revolve around a shared metaphor. The metaphor in this case pictures an 'economy' as a territory whose boundaries can be contracted or expanded by, among other actions, delimiting or expanding accounting practices (Dove, 1999, pp.2–3). Alternatively, environmental objects such as land or climatic stability can be transported across a boundary into the territory of an economy with the help of new accounting and other technical and legal practices. Received wisdom and standard critique differ only about what happens to these invariant objects when they are shipped over the border. According to received wisdom, they benefit when calculation reveals their intrinsic value or at least a useful 'proxy' thereof (Barnes, 2001, p. 88), leaving behind at most only a 'philosophical' (Independent, 2007) residuum. According to the standard critique, however, the value of such objects is intrinsically or constitutively incalculable, meaning that their survival itself can be threatened when they are treated otherwise.

The metaphor of a territorial 'economy' influences a great deal of both scholarly and popular discourse, inspiring important work on all sides. Its influence can be detected in commonplace expressions ranging from 'in a world ruled by markets, a market solution must be made to work for the environment' (Evangelista, 2007) to 'our preaching's and sermons will be for naught if we don't inscribe them on tablets that markets can understand' (Barnes, 2001, p. 88) to 'the market economy is not a neutral medium for conservation but rather a corrosive acid bath which dissolves many conservation practices it comes into contact with' (Lohmann, 1991,p. 100). However, like all metaphors, it opens one path of inquiry only by obscuring others.

Critical sociologists and anthropologists of markets such as Callon (1998a, 1998b, 1999, 2005) and Mitchell (2002) have recently proposed a fresh metaphor, that of 'framing', which, they suggest, helps open new paths of inquiry. Market exchange becomes possible, they argue, only through a laborious and ongoing process of construction of spaces for calculation and transaction, of accounting systems that determine both who is accountable and how and what to count and not to count, and of simplified, uncontroversial owners, products and modes of ownership. 'Agents and goods involved in calculations', Callonsays, 'must be disentangled and framed if calculations are to be performed and completed' (Callon, 1999, p.186). Nineteenth-century Chicago grain futures, for example, could emerge only when it became physically and socially possible to standardize grain and commensurate its present and future incarnations, transporting it in railroad cars and storing it in steam-powered grain elevators instead of the sacks that had previously entangled each bit of grain with its grower until it reached its final buyer (Cronon, 1991, pp. 97–147, cited in MacKenzie, 2009, 440–455; Espeland & Stevens, 1998, p. 318). Similarly, the automobile market is possible only because buyers and sellers alike take it for granted that it is the car company that owns the product. Any possible claims of partial ownership by workers or communities near sources of raw materials are elided, along with other potential nuisances such as medieval notions of 'fair price'. In addition, many costs associated with the automobile sector – certain kinds of pollution, problems associated with forms of social organization dependent on personal mobility, and so on – are put off on the community as a whole.

The metaphor of framing is clearly indebted to the insight of Polanyi (2002 [1944], p. 146) that '[t]he road to the free market was opened and kept open by an enormous increase in continuous, centrally-organized and controlled interventionism'. But instead of picturing a 'self-regulating' market being 'disembedded' or liberated from a larger social ground that previously contained and constrained it (Polanyi, 2002, [1944], p. 144), the metaphor pictures economies as 'embedded in economics', their every aspect – property, merchandise, actors, contract, product quality – not only described, defined and measured but constituted, nurtured, 'performed' and transformed by a multitude of practices of calculation and governmentality originating both in academia and 'in the wild' among economic agents at large (Callon, 2005, p. 9). 'Expert knowledge', in the words of Mitchell, 'works to format social relations, never simply to report or picture them' (Mitchell, 2002, p. 118). One instance of such expert knowledge is accounting procedures, which, as Peter Miller argues, are 'intrinsic to and constitutive of social relations, rather than secondary and derivative' (Miller, 2001, p. 392).

Double-entry bookkeeping, for example, 'was devised to account for business transactions, but
once established, it altered these transactions by changing the way businessmen interpreted and understood them' (Carruthers & Espeland, 1991, p. 36). It influenced the premises of decision making rather than just

being a tool for implementing them. Similarly, if application of economic theory often 'makes economic processes more like their depiction by economics' (MacKenzie, 2009, pp. 440–455), so Homo economicus traits can often be fostered in human beings merely through the commensuration involved in simple accounting innovations. Fining parents for showing up late to pick up their children from school, for instance, can paradoxically incentivize parental delinquency by replacing a moral stigma with a financial penalty (Gneezy & Rustichini, 2000). By the same token, making good behaviour a matter for financial reward (as when people are paid for giving blood) can discourage it (Titmuss, 1996 [1972]). Net present value calculations and cost–benefit analysis have a similar potential to mould the behaviours that, ironically, they posit as invariant, in ways that increase (or decrease) their 'fit' with theory (Anderson, 1993; Radin, 1996; cf. Nussbaum, 2001, p. 195). As Plato understood, commensuration is often a social change and an achievement, rather than a report on the status quo (Nussbaum, 1986). 'We see the world remade, not the world we live in', Nussbaum remarks (Nussbaum, 1997, p. 1200).

By the same token, just as census work helps create categories such as 'the Hispanic vote' (Anderson, 1999, p. 43; Petersen, 1987, pp. 223–229) or 'the unemployed' that become effective collective political agencies subject to their own discipline (Espeland & Stevens, 1998, p. 331), so too, accounting helps produce agents and other entities. Thus the Kyoto Protocol's carbon monitoring system, which categorizes emissions sources according to physical location on national territories, helps ensure that nation–states are treated as the agents of global warming despite the fact that transnational entities such as multinational corporations, international financial institutions or social classes are, on some views, equally plausible candidates. Similarly, while the category of 'water quality' as used in accounting for the costs and benefits of hydroelectric dams comes into being through the rather ad hoc aggregation of attributes such as temperature, amount of dissolved solids, turbidity and pH (Espeland & Stevens, 1998, p. 317), it ultimately becomes an entity as 'real' in policy deliberations as any other. As will be argued below, such globally-recognized objects as 'certified emissions reductions' likewise exist only by virtue of a chain of disentangling, commensurating, simplifying and boundary-drawing calculating practices. Framing, unlike boundary-crossing, is a neverending process. Each act of framing, because it 'mobilizes or concerns objects or beings endowed with an irreducible autonomy' (Callon, 1998a, p. 39), is also a source of what Callon (1998a, p. 39) terms 'overflowing'. There are 'always relations which defy framing'. The 'constraints, understandings and powers that frame the economic act. . .and thus make the economy possible, at the same time render it incomplete' (Mitchell, 2002, p. 191). '[I]t is one and the same movement which causes calculative agencies to proliferate, while reinscribing them into spaces of noncalculability' (Callon, 1998a, p. 39). Only by the creation of overflows and new entanglements is framing even possible. Every attempt to bring something 'inside' creates new 'outsides'. Market agents and goods are always 'boundary objects' (Star & Griesemer, 1989) which, while partly resynthesized for a market, at the same time maintain and continue to develop characteristics relating to other contexts, as an actor plays a role without ever becoming it. Individuals framed as the mute, maximizing bundles of preferences of economic theory, for instance, are constantly – fortunately for the market – reasserting themselves as persuasive negotiators with voices and relationships (McCloskey, 1998, pp. 95–97). Similarly, money, framed as a unitary solvent of social ties, is, in the hands of its users, constantly fragmented into discrete, incommensurate categories – a process that turns out to be essential for accounting itself (Callon, 1998a; Zelizer, 1997). Indeed, framing institutions themselves cannot be separated from what they frame with any guarantee of stability. Frames for market negotiation are themselves negotiable. On close examination, the purported border of a market is 'not a line on a map, but a horizon that at every point opens up into other territories' (Mitchell, 2002, p. 292). Spaces of calculation and noncalculation cannot be walled off in rigid, mutually-exclusive spheres (cf. Walzer, 1983). It follows that every attempt to identify and frame overflows themselves, or to internalize externalities, creates further overflows or externalities. What economic theory refers to as the category of externalities is not incidental and residual, but central and enduring. Full cost accounting is an everreceding mirage. Just as the successful corporation, in the words of investment banker Robert Monks, must always play the role of an 'externalising machine' (quoted in Bakan, 2004, p. 70), so markets themselves 'would be impossible if people were made to account for every cost' (Mitchell, 2002, p. 290). Every market transaction must exclude 'features of the world that actors do not have to take into account', indirectly revealing 'all the work that has to be done, all the investments that have to be made in order to make relations calculable in a network' (Callon, 1999, p. 188).1 In a sense, projects such as Al Gore's or Nicholas

Stern's can never be completed.

In extreme cases, or what Callon calls 'hot' situations, even negotiations aimed merely at identifying overflows are incomplete or unachievable, interests are unstable, and the identity of actors is unclear, making continued framing exercises impossible or premature. Although 'externalities are at the centre of public debates', conditions are not 'cool' to carry out the spadework needed to establish commercial relations. In 'cooler' situations, processes through which products, their owners, and the rules of calculation are framed are often not only carried out, but can be 'black-boxed' as well. In certain commodity markets, for instance, it becomes possible to refer to the 'efficiency' of economies of scale while eliding the 'inefficient' violence or legal action that created the possibility of scale (e.g., large reserves of land or labour) and the requisite large demand in the first place (Lohmann, 1995), even Whiggishly assuming that such markets came about because they were 'efficient' ab ovo. Practical successes in framing living, breathing approximations of Homo economicus help make it plausible to 'naturalize' the species' traits, reading them back into human nature. Similarly, practical successes in framing land, forests or wild fish as 'manageable natural resources' help make it possible to regard trade in 'ecosystem goods and services' as uncontroversial, even inevitable (Holm, 2007). Nevertheless, even when the stage-setting for acts of calculation and exchange is fairly successful, the 'black-box' in which the inevitable entanglements have been stuffed and concealed has a permanent potential to become a 'jack in the box', complicating or disrupting hitherto smooth exchanges. Rural villagers and other non-professionals often contest framing processes in which they have not been enlisted, if they damage their perceived interests, dismissing environmental accountancy out of hand or even driving technical experts from their localities by force. Academics with an outsider's perspective and a willingness to 'regard our own world as a problem, a proper site for ethnographic inquiry' (Comaroff & Comaroff, 1991, p. 6) meanwhile often busy themselves with excavating and opening the black-boxes. Thus Espeland and Stevens (1998, p. 327) emphasize the 'largely invisible' yet 'vast resources, discipline and organization' that go into commensuration, while Mitchell (2002, p. 299) taxonomizes the diverse and unanticipated results of the 'violence and theory' that go into framing 'Egypt's economy' – including military intervention and the theory of economics itself. Even scholars such as Desrosieres (1996, pp. 336–367), who are more prone to emphasize the social value of keeping the 'black-boxes' closed and the costs of opening them, acknowledge, in effect that the dialectic of framing and overflowing is continuous.

As Espeland and Stevens (1998, p. 317) emphasize, commensuration can be understood as a system for 'absorbing uncertainties'. But where accounting practices required for a new market

encounter complexities, uncertainties, nonlinearities and indeterminacies that they cannot immediately accommodate, they also often actively rework their objects, whether they involve human or non-human objects, to try to make them more 'passive' and tractable to the agencies of calculation. As Bowker and Star (2005, p. 254) remark of classification procedures generally, 'it is not a question of mapping a pre-existing territory but of making the map and the territory converge'. Commensuration in particular, as Espeland and Stevens note, 'has the power to transform what it measures' (Espeland & Stevens, 1998, p. 334). In recent years, Scott (1999) has been particularly energetic in documenting the mechanisms of, and blowbacks from, 'state simplifications' of human and non-human structures alike, from managed woodlands to village layouts. In short, the metaphor of framing challenges the picture the objects of accounting as stable, pre-existing and transportable across borders. Instead of focusing on imagined pre-existing or intrinsic properties of environmental objects and agents, it focuses on what produces and sustains the objects and agents. Rather than picturing essentialized objects moving across sharply-delineated boundaries between what is internal and external to an economy, the framing metaphor sees objects constantly being made and remade, and boundaries as fluid or poorly-defined. Correspondingly, it sees 'failure' of quantification as a matter of the social problems connected with achieving commensuration rather than flowing from the intrinsic properties of objects (Radin, 1996). This casts doubt on the common notion that there is a monolithic entity called 'the market economy' or 'capitalism' that might someday expand to annex everything that is outside it, or whose hegemony is so complete that any environmental solution must be cast in its mold. As Callon stresses, 'speeches – optimistic as well as pessimistic – on ''the inexorable growth of the marketplace" have no foundation in fact. . .the market must be constantly reformed and built up from scratch: it never ceases to emerge and re-emerge in the course of long and stormy negotiations in which the social sciences have no choice but to participate' (Callon, 1999, p. 266). But it also casts doubt

on the idea that there are things that are by their nature resistant to such imaginary monoliths, or that criticism of one or another type of incipient market presupposes essentialism about markets. According to the new metaphor, it may not be fruitful to analyze environmental protection as a matter of either integration into, or isolation from, market economies. Rather, it suggests that closer attention be paid to specific contexts and nets of practices.

02. Objectives of the study:

Interest is growing in modifying national income accounting systems to promote understanding of the links between economy and environment. The field of green accounting has made great strides in the past two decades, moving from a rather arcane endeavor to one tested in dozens of countries and well established in a few. But the idea that nations might integrate the economic role of the environment into their income accounts is neither a quick sell nor a quick process; it has been under discuss since the 1960s. Despite the difficulties and controversies described in this articles, however, interest is growing in modifying national income accounting systems to promote understanding the links between economy and environments.

03. Methodology of the study:

This study is attempted to find out various problematic aspects of green accounting and it is mainly in nature. Both primary and secondary data have been used in this regard. Keeping the aforesaid objectives in mind efforts were made to collect data from those who were very closely related to accounting and decision making in various organization. The secondary data were collected from related journals, newspapers, websites, research reports of concern discipline and so forth were gone through for having the information.

04. Green Accounting

A rising demand by lawmakers and regulators for businesses to address the potential threats posed by climate change and other environmental issues is the primary force behind green accounting. The recent transition of power in Washington is also likely to speed the move to new green-oriented laws and regulations, because the Obama administration is generally viewed as being friendlier toward government environmental initiatives than the Bush administration. The term "green accounting" hasn't yet been fully defined. Most agree, however, that in order for a business to be able to reduce its carbon footprint, it first must be able to measure it. Then, once the size of the carbon footprint is known, a business must be able to report the data to regulators, taxation officials, carbon credit trading organizations and other relevant parties.

05. Green Management Accounting

According to the EPA, green or environmental management accounting is “the identification, prioritization, quantification or qualification, and incorporation of environmental costs into business decisions.” Green Management Accounting uses “data about environmental costs and performance for business decisions. It collects cost, production, inventory, and waste cost and performance for business decisions. It collects cost, production, inventory, and waste cost and performance data in the accounting system to plan, evaluate, and control.”

Environmental management accounting thus represents a combined approach which provides for the transition of data from financial accounting and cost accounting to increase material efficiency, reduce environmental impact and risk, and reduce costs of environmental protection.

06. Green or Environmental Accountants

Green accountants are held responsible to identify and track green costs often times working with site, research and development, and production managers when planning their budgets. In the past, such costs were buried in overhead preventing a clear picture of the cost savings and benefits to the product, process, system or facility responsible for the green initiatives.

Green accountants help management recognize that the tax benefits, rebates and lower costs of being environmentally friendly add up to a real bottom-line reward for doing the right thing. "Public environmental, social and sustainability reporting is the main route through which corporate accountability and integrity can be demonstrated," claims the London-based Association of Chartered Certified Accountants in its report, "Environmental, Social and Sustainability Reporting on the World Wide Web."

07. Federal Environmental Acts and Environmental Audits

Environmental costs and liabilities are primarily driven by increasing federal regulation and enforcement. Federal environmental acts establish requirements for remediation, abatement, and prevention of hazardous waste sites. The three major acts are: The Comprehensive Environmental Response, Compensation, and

Liability Act of 1980 (CERCLA). Better known as Superfund, this act requires Potentially Responsible Parties (PRPs) to incur costs for remediation. The EPA identifies PRPs as firms with operations involving hazardous waste and site contamination.

The Resource Conservation and Recovery Act of 1976 (RCRA) is concerned with preventing events that could lead to contamination and result in the need for future site cleanups. It establishes responsibility for the monitoring, transportation, treatment, storage, and disposal of hazardous wastes.

The Clean Air Act Amendments of 1990 (CAAA) attempt to reduce pollution by requiring public utilities to restrict the amount of sulfur dioxide and nitrogen oxides that their generating units may emit.

Violation of these statutes can result insignificant fines, remediation costs, or even imprisonment. The EPA, through the Department of Justice, charges 05 to 10 engineers and business people per week with criminal violations of environmental regulations. Liability for environmental wrongdoing is strict, joint and several, and retroactive. Furthermore, lack of knowledge is not a defense and negligence may result in imprisonment. thus, companies need to be particularly careful when dealing with environmental laws.

As with legal liabilities, accountants must rely on the work and opinions of experts in other fields to determine the impact of environmental issues. Firms may undergo an environmental audit to determine the legislation applicable to the firm, to assess the compliance of the firm with the legislation, and to assist in estimating environmental liabilities.

A team of internal and external experts, including environmental engineers and legal counsel, performs the audit. The team reports findings to company management by issuing a formal environmental audit report. Where appropriate, this report includes recommendations for attaining regulatory compliance and improving environmental cost efficiency.

08. Analysis:

08.01. Why Change?

Governments around the world develop economic data systems known as national income accounts to calculate macroeconomic indicators such as gross domestic product. Building a nation's economic use of the environment into such accounts is a response to several perceived flaws in the System of National Accounts (SNA), as defined by the United Nations and used internationally. One flaw in the SNA often cited is that the cost of environmental protection cannot be identified. Consequently, money spent, say, to put pollution control devices on smokestacks increases GDP, even though the expenditure is not economically productive, some argue. These critics call for differentiating "defensive" expenditures from others within the accounts.

Also misleading is the fact that some environmental goods are not marketed though they provide economic value. Fuelwood gathered in forests, meat and fish gathered for consumption, and medicinal plants are examples. So are drinking and irrigation water, whose sale prices reflect the cost of distribution and treatment infrastructure, but not the water itself. While some countries do include such goods in their national income accounts, no standard practices exist for doing so. When nonmarketed goods are included in the accounts, they still cannot be distinguished from those that are marketed.

Valuing environmental services such as the watershed protection that forests afford and the crop fertilization that insects provide is difficult. Though some experts call for their inclusion in environmentally adjusted accounts, typically neither the economic value nor the degradation of these services is included. On the other hand, however, the alternate goods and services needed to replace them—water treatment plants, for example—do contribute to GDP, which can be rather misleading.

Still another problem is that national income accounts treat the depreciation of manufactured capital and natural capital differently. Physical capital—a building or a machine, for instance—is depreciated in accordance with conventional business accounting principles, while all consumption of natural capital is accounted for as income. Thus the accounts of a country that harvests its forests unsustainably will show high income for a few years, but will not reflect the destruction of the productive forest asset. While opinions vary on how to depreciate natural capital, they converge on the need to do so.

08.02. Which Indicators Are Useful?

Some proponents advocate simple "flag" indicators to alert policymakers to the broad role of the environment in the economy, for example, comparing conventional GDP with environmentally adjusted GDP, or conventional savings with so-called "genuine" savings that account for environmental factors. Both of these indicators can provide valuable warnings of the impacts of environmental degradation on an

economy.

However, such flags are less useful in determining the source of environmental harm or identifying a policy response. For this reason, many economists place primary importance not on the bottom line, but on the underlying data used to build environmental accounts. These data can help answer such questions as how natural catastrophes like the fires that raged in Indonesia in the summer of 1998 may affect economic growth, or how environmental protection policies such as green taxes may affect the economy.

08.03. Who Is Doing This?

Environmental accounting is underway in several dozen countries, where bureaucrats, statisticians, and other proponents both foreign and domestic have initiated activities over the past few decades. Several countries have made continuous investments in building routine data systems, which are integrated into existing statistical systems and economic planning activities. Others have made more limited efforts to calculate a few indicators, or analyze a single sector. Some of the earliest research on environmental accounting was done at RFF by Henry Peskin, working on the design of accounts for the United States.

One of the first countries to build environmental accounts is Norway, which began collecting data on energy sources, fisheries, forests, and minerals in the 1970s to address resource scarcity. Over time, the Norwegians have expanded their accounts to include data on air pollutant emissions. Their accounts feed into a model of the national economy, which policymakers use to assess the energy implications of alternate growth strategies. Inclusion of these data also allows them to anticipate the impacts of different growth patterns on compliance with international
conventions on pollutant emissions.

More recently, a number of resource-dependent countries have become interested in measuring depreciation of their natural assets and adjusting their GDPs environmentally. One impetus for their interest was the 1989 study “Wasting Assets: Natural Resources in the National Income Accounts,” in which Robert Repetto and his colleagues at the World Resources Institute estimated the depreciation of Indonesia’s forests, petroleum reserves, and soil assets. Once adjusted to account for that depreciation, Indonesia’s GDP and growth rates both sank significantly below conventional figures. While “Wasting Assets” called many to action, it also operated as a brake, leading many economists and statisticians to warn against a focus on green GDP, because it tells decision makers nothing about the causes or solutions for environmental
problems.

Since that time, several developing countries have made long-term commitments to broad-based environmental accounting. Namibia began work on resource accounts in 1994, addressing such questions as whether the government has been able to capture rents from the minerals and fisheries sectors, how to allocate scarce water supplies, and how rangeland degradation affects the value of livestock. The Philippines began work on environmental accounts in 1990. The approach used there is to build all economic inputs and outputs into the accounts, including nonmarketed goods and services of the environment. Thus Filipinos estimate monetary values
for such items as gathered fuel wood and the waste disposal services provided by air, water, and land; they then add in direct consumption of such services as recreation and aesthetic appreciation of the natural world. While their methodology is controversial, these accounts have rovided Philippine government agencies and researchers with a rich array of data for policymaking and analysis.

The United States has not been a leader in the environmental accounting arena. At the start of the
Clinton administration, the Bureau of Economic Analysis (BEA) made a foray into environmental accounting in the minerals sector, but this preliminary attempt became embroiled in political controversy and faced opposition from the minerals industry. Congress then asked the National Research Council (NRC) to form a blue ribbon panel to consider what the nation should do in the way of environmental accounting. Since then, Congressional appropriations to BEA have been accompanied by an explicit prohibition on environmental accounting work. The ban may be lifted, however, once the recommendations of the NRC study are made public.

08.04. Who will be affected?

Energy-reliant manufacturers and power-generating utilities will feel the most pressure to embrace green accounting, but companies in nearly all business sectors can expect to embrace green accounting at some level within the next few years. Retailers, for example, may need green accounting software to calculate

carbon ratings for each product on their shelves. It's possible that a wide number of businesses may need to use carbon accounting programs to calculate taxes based on the amount of energy consumed.

08.05. What technologies are involved?

Green accounting encompasses several different technology areas. Look for both accounting and ERP (enterprise resource planning) software vendors to begin adding more green-oriented features into their products. Among the programs currently available, or headed to market, are carbon unit measurement and management tools, as well as programs designed to enable companies to trade carbon credits. Yet another type of green accounting software aims to help businesses cut through the "green tape" created by climate change regulations.

08.06. How to Account?

How environmental accounting is being done varies in a number of respects, notably the magnitude of the investment required, the objectivity of the data, the ability to compare different kinds of environmental impacts, and the kinds of policy purposes to which they may be applied. Here are some of the methods currently in use.

08.06.01. Natural Resource Accounts : These include data on stocks of natural resources and changes in them caused by either natural processes or human use. Such accounts typically cover agricultural land, fisheries, forests, minerals and petroleum, and water. In some countries, the accounts also include monetary data on the value of such resources. But attempts at valuation raise significant technical difficulties. It is fairly easy to track the value of resource *flows* when the goods are sold in markets, as in the case of timber and fish. Valuing *changes in the stocks*, however, is more difficult because they could be the result either of a physical change in the resource or of a fluctuation in market price.

For environmental goods and services that are not sold, it is that much harder to establish the value either of the flow or of a change in stock. However, even physical data can be linked to the economy for policy purposes. For example, changes in income can sometimes be traced to changes in the resource base or to the impact of environmental catastrophes on the economy.

08.06.02. Emissions accounting*:* Developed by the Dutch, the National Accounting Matrix including Environmental Accounts (NAMEA) structures the accounts in a matrix, which identifies pollutant emissions by economic sector. Eurostat, the statistical arm of the European Union, is helping EU members apply this approach as part of its environmental accounting program. The physical data in the NAMEA system are used to assess the impact of different growth strategies

on environmental quality. Data can also be separated by type of pollutant emission to understand the impact on domestic, transborder, or global environments. If emissions are valued in monetary terms, these values can be used to determine the economic cost of avoiding environmental degradation in the first place, as well as to compare costs and benefits of environmental protection.

08.06.03. Disaggregation of conventional national accounts*:* Sometimes data in the conventional accounts are taken apart to identify expenditures specifically related to the environment, such as those incurred to prevent or mitigate harm, to buy and install protection equipment, or to pay for charges and subsidies. Over time, revelation of these data makes it possible to observe links between changes in environmental policy and costs of environmental protection, as well as to track the evolution of the environmental protection industry.

While these data are of obvious interest, some people argue that looking at them in isolation can be misleading. For example, while end-of-pipe pollution control equipment is easily observed, new factories and vehicles increasingly are lowering their pollutant emissions through product redesign or process change rather than relying on special equipment. In such cases, no pollution control expenditures would show up in the accounts, yet environmental performance might be better than in a case where expenditures do show up.

08.06.04. Value of non marketed environmental goods and services: Considerable controversy exists over whether to include the imputed value of non marketed environmental goods and services in environmental accounts, such as the benefits of an unpolluted lake or a scenic vista. On the one hand, the value of these items is crucial if the accounts are to be used to assess tradeoffs between economic and environmental goals. Otherwise, the accounts can end up reflecting the costs of protecting the environment without in any way reflecting the benefits. On the other hand, some

people feel that valuation is a modeling activity that goes beyond conventional accounting and should not

be directly linked to the SNA. The concern underlying their view is that it is difficult to standardize valuation methods, so the resulting accounts may not be comparable across countries or economic sectors within a country.

08.06.05. Green GDP: Developing a gross domestic product that includes the environment is also a matter of controversy. Most people actively involved in building environmental accounts minimize its importance. Because environmental accounting methods are not standardized, a green GDP can have a different meaning in each project that calculates it, so values are not comparable across countries. Moreover, while a green GDP can draw attention to policy problems, it is not useful
for figuring out how to resolve them. Nevertheless, most accounting projects that include monetary values do calculate this indicator. Great interest in it exists despite its limitations.

08.07. Toward Consensus on Method

Environmental accounting would receive a substantial boost if an international consensus could be reached on methodology. The UN Statistics Department has coordinated some of the ongoing efforts toward this end since the 1980s. In 1993, the UN published the System for Integrated Economic and Environmental Accounting (SEEA) as an annex to the 1993 revisions of the SNA. SEEA is structured as a series of methodological options, which include most of the different
accounting activities described above; users choose the options most appropriate to their needs.

No consensus exists on the various methods that the UN recommended. In fact, SEEA is now undergoing revision by the so-called "London Group," comprised primarily of national income accountants and statisticians from OECD countries. The group's work will be an important step toward consensus on accounting methods, but the process will be lengthy: Development of the conventional SNA took some forty years.

08.08. Toward Widespread Use

A number of steps can be taken now toward the goal of ensuring that environmental accounting is as well established as the SNA. First, information must circulate freely about existing environmental accounts and how they are contributing to economic and environmental policy. Ongoing work needs to be identified and systematically reviewed and analyzed to learn lessons, which may inform the design and implementation of future accounting activities. The Green
Accounting Initiative of the World Conservation Union has embarked on this effort, and a number of other organizations are calling for similar activities. Use of the World Wide Web may facilitate access to unpublished work, although it will require a concerted effort to obtain accounting reports and seek permission to load them on the Internet.

Second, development of a core of internationally standardized methods will contribute to willingness to adopt environmental accounting. Experts in the field—including economists, environmentalists, academics, and others outside of the national statistical offices—should take a proactive role in tracking the work of the London Group and insist that the standard- setting process involve participants representing a spectrum of viewpoints, countries, and interested stakeholders. An opportunity exists for research institutes to take a lead in identifying the financial resources needed to facilitate a broader standard setting process, and to elicit a full range of voices to build a consensus on methodology.

Finally, and perhaps most importantly, the more countries institutionalize construction of environmental accounts, the greater the momentum for more of the same.

Still, building accounts—like developing any time series statistics—will not happen overnight. Their construction will require sustained institutional and financial commitment to ensure that the investment lasts long enough to yield results. But the experiences of Norway, Namibia, and the Philippines show that such a commitment can pay off; it is a commitment that more countries around the world need to make.

08.09. How much will green accounting cost by business?

The financial impact will vary depending on company's size and line of business. For small firms with a relatively modest CO2 impact, the costs could be minimal. In fact, many finance and accounting software vendors may simply incorporate green accounting features into upgraded versions of existing products. On the other hand, companies that are heavy users or producers of energy, or that must manage large amounts of CO2 emissions, will likely have to spend significant sums on specialized software and collection instrumentation that will track, organize and report vast amounts of carbon data, perhaps at a number of different sites.

08.10. Managerial Accounting and Auditing Concerns.

The impact of environmental issues on accounting professionals is not limited to financial reporting. It affects managerial accounting, environmental costs must be recognized, measured, and included in product costs and firm decisions. Practitioner journals are already responding to this need (Kreuze & Newell, 1994; Brooks, et. al, 1993). In auditing, environmental issues present substantial challenges. Not only muse auditors attest to the fairness and appropriateness of recorded environmental issues, but they must be aware of possible unrecorded environmental liabilities.

08.11. Recording Environmental Liabilities

Although accounting for environmental exposure is one of the six issues considered tremendously important to the SEC, no environmental-specific GAAP has yet been issued. Accountants rely on existing GAAP (FASB #5, FIN #14) to account for environmental issues. Consequently, there is an increasing need for accountants to be familiar with the substance of and potential financial treatment of environmental liabilities and costs.

Currently, the major financial accounting issue in environmental accounting is estimating and recording environmental liabilities in the financial statements. Treating environmental costs as loss contingencies is most common in practice. FASB #5 provides guidance in defining and determining how to report loss contingencies, and FIN #14 provides guidance in estimating them. FASB #5 defines a loss contingency as: An existing condition, situation or set of circumstances involving uncertainty as to possible gain or loss to an enterprise that will ultimately be resolved when one or more future events occur or fail to occur.

Environmental liabilities often fit this description. The possibility of a company's noncompliance with environmental regulations is the "uncertain condition." The "future event" that resolves his uncertain condition is the declaration by regulatory agencies that the company is or is not liable to pay damages for harming the environment.

09. Conclusion:

Environmental issues have increased in importance in past decades. That this trend promises to continue is reflected in the increasing financial attention firms are giving to these issues. Thus, accountants need to be aware of environmental issues and to consider their influence upon both
internal and external reporting. The evolution of the appropriate financial treatment (GAAP) for these issues will provide challenges to accounting professionals. This evolution is interesting both for its own sake and also for the perspective it provides on other emerging GAAP issues.

Greening the national accounts is necessary specially in the developing countries like Bangladesh both for economic and environmental policy formulation. Bangladesh is centered generally on natural resource based economy and characterized by high population growth and pressure on natural resources. Thus, in Bangladesh, oversight or the misuse and exhaustion of the country’s natural capital will lead to extended valuation of the national income figures. This gives a false illusion that our economy is growing when in fact natural wealth the future wealth is declining. By having some green indicators like environment adjusted domestic product (EDP), green GDP, our policies can be designed to enhance economic growth without extensive depletion of natural resources.

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