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The World Conservation Union

Environmental Accounting: What's It All About?

Introduction

Environmental accounting is an important tool for understanding the role played by the natural environment in the economy. Environmental accounts provide data which highlight both the contribution of natural resources to economic well-being and the costs imposed by pollution or resource degradation. For this reason, IUCN has launched a new program, the Green Accounting Initiative, to help its members understand how this tool can help them improve environmental management.

This booklet provides a simple introduction to environmental accounting, explaining:

· what it is;
· why it matters;
· how it is done;
· who is working on it; and
· how to get started.

The Environment and the System of National Accounts

"Environmental accounting" - sometimes referred to as "green accounting", "resource accounting" or "integrated economic and environmental accounting" - refers to modification of the System of National Accounts to incorporate the use or depletion of natural resources.

The System of National Accounts (or SNA) is the set of accounts which national governments compile routinely to track the activity of their economies. SNA data are used to calculate major economic indicators including gross domestic product (GDP), gross national product (GNP), savings rates, and trade balance figures. The data underlying these aggregate indicators are also used for a wide range of less publicized but equally valuable policy analysis and economic monitoring purposes.

These economic accounts are calculated by all countries in a standard format, using a framework developed, supported, and disseminated by the United Nations Statistical Division (UNSTAT). The fact that all countries make these calculations in more or less

the same way is crucial to the value of the data for national and international decision-making, because it makes international comparisons possible and thus allows us to place individual countries in the context of world trends. Similarly, the fact that the accounts are calculated routinely, rather than just once, lets us use them to understand how the world is evolving, and where each country fits within that pattern of change. This provides a valuable basis for defining public policies designed to move individual countries and the world towards desired patterns of growth and development.

What's Wrong with the SNA?

The movement to reform the SNA has arisen because the accounts as now defined do not include the full economic value of environmental resources or the role which they play in productive activity. Some of the elements missing from the accounts include:

· Environmental expenditures. Expenditures to protect the environment from harm, or to mitigate that harm, cannot not be identified from the data in the accounts. Such expenditures include the costs incurred to prevent environmental harm, such as pollution control equipment purchased by factories or catalytic converters in cars. They also include the costs of remedying that harm; medical expenses, replacement of property destroyed in landslides caused by deforestation, or drinking water filtration required because intake water is highly sedimented. These expenditures are already included in the income accounts, along with all other intermediate or final consumption. However, they cannot be disaggregated to highlight the costs incurred to prevent or mitigate environmental degradation.

· Non-marketed goods. The environment provides many goods which are not sold, but which are nevertheless of value; e.g., fuelwood and building materials gathered in forests, meat and fish captured for consumption, and medicinal plants . Some countries do include these in their national income accounts, estimating total consumption, and then using market prices for comparable products as a proxy to calculate the value of non-marketed goods. However, such estimation is incomplete, and cannot always be disaggregated from products which are sold.

· Non-marketed services. Similarly, the environment provides unsold services, such as watershed protection by forests or water filtration by submerged vegetation. These are not included in the SNA. It can be very difficult to estimate their economic value; this is sometimes done by calculating the cost of obtaining equivalent services from the market.

· Consumption of natural capital. The SNA treats the gradual depletion of physical capital - machines and other equipment - as depletion rather than income, in accordance with conventional business accounting principles. However, the depletion of natural capital - forests, in particular - is accounted for as income. Thus the accounts of a country which harvests trees very quickly will show quite high income for a few years, but nothing will show the destruction of a productive asset, the forest. Most experts on environmental accounting agree that the depletion of natural capital should be accounted for in the same way as other productive assets.

How Should We Change the SNA?

The SNA is a complex system, which follows a number of widely-accepted accounting conventions. These conventions ensure logical consistency across the different components of the accounts, guaranteeing that a given type of entry has the same meaning in all contexts and in all countries. This standardization is essential for the accounts to be a reliable source of comparable data about the economies of many different countries.
At the same time, this standardization makes it difficult to change the SNA in order to introduce a quite different "product" like the goods and services provided by the environment. The difficulty arises primarily because most environmental goods and services are not traded in conventional markets; thus it is hard both to define discrete products and to put a monetary value on them.

Because this task is so difficult, there has been considerable discussion over the past twenty years of strategies for modifying the SNA. While the questions have not yet been fully resolved, substantial headway has been made and more is expected in the next five years. Some of the most important debates concern the following issues:

· Physical vs. monetary accounts. Physical accounts only include information about natural characteristics of the environment and its use; the size of forests or mineral reserves, the quality of water or air, the depth of topsoil, etc.. In contrast, monetary accounts place an economic value on those characteristics or their use, so as to understand the role they play in the economy. Given the difficulty of estimating the monetary value of certain aspects of the environment, some individuals (and countries) advocate development of only physical accounts.

· Integrated accounts vs. satellite accounts. Integrated accounts change the calculation of GNP, GDP, and other key national indicators. Satellite accounts (of which physical accounts are one example) are linked to the SNA, but do not change either the calculation of key indicators or the central framework of the accounts. The advantage of satellite accounts is that they allow the accountants to violate some of the conventions of the SNA in ways quite useful for environmental data, without threatening the consistency of the information in the conventional accounts. However because they do not change GNP or GDP, they do not correct the distortions inherent in those indicators.

· Net benefit vs. user cost method of calculating depletion. These are two different methods for estimating the depletion of natural capital. The net benefit method is much simpler than the user cost method, and therefore has been used widely. It is considered technically incorrect by economists; however, those who use it feel that despite its inaccuracy it offers an acceptable proxy value for depletion.

· Inclusion of "maintenance costs." Maintenance costs are the expenditures that a country would have to make in order for its use of the environment to be sustainable. Some experts on environmental accounting believe that these should be deducted from the accounts to arrive at a correct level of "green" economic activity. Others argue that estimation of such costs is highly subjective and subtracting them from indicators like GDP is misleading.
· Valuation of non-marketed environmental services. Most approaches to environmental accounting do not include this item, because the valuation required is difficult and

subjective. However it is of interest to environmentalists in many countries, so its inclusion still warrants strong consideration.

These are not merely arcane statistical issues. The ways in which they are resolved will determine how environmental accounts are used to support policy-making. Moreover, if the international community can come to consensus - irrespective of the methods they choose - their agreement on one set of standard accounting principles will encourage many hesitant governments to move into this relative new arena.

What Environmental Accounting Is - And Is Not:

It is: a set of aggregate national data linking the environment to the economy, which will have a long-run impact on both economic and environmental policy-making.

It is not: valuation of environmental goods or services, social cost-benefit analysis of projects affecting the environment, or disaggregated regional or local data about the environment.
There are, however, close links between environmental accounting and these three activities, which is why they are frequently discussed together and occasionally confused.

· Valuation of environmental assets, goods, or services. "Valuation" refers to the process of deriving a monetary value for things which are not sold in a market; for example, fuelwood gathered in the forest, water filtration provided by a wetland, or biodiversity resources which could provide new medicines in the future. Valuation is an essential input into both social cost-benefit analysis and some approaches to environmental accounting. However valuation is only one element in the construction of environmental accounts; it is not the same as the construction of the accounts.

· Social cost-benefit analysis. Social cost-benefit analysis tallies up all of the costs and benefits of a proposed project, including its impacts on environmental quality or on the availability of environmental goods and services. It relies on the same valuation data that may be used in environmental accounting, though the different estimated values are aggregated differently. Thus the valuation work entailed in implementing environmental accounts may also provide data for analyzing the impacts of specific projects.

· Disaggregated regional or local data about the environment, sometimes linked to a geographic information system. Questions often arise about the scale of environmental data; do they pertain to a village, a province, a watershed, or the whole country? Because the SNA is national, and most countries maintain their economic data at the national (rather than the regional or local) level, environmental accounts are primarily national accounts. For example, they might tell us how much energy was consumed nationwide, not how much was consumed in each village or province. Sometimes national figures are obtained by aggregating local data, though; for example, national data timber harvests might originate with a survey of individual logging camps. Thus accounts sometimes can provide local as well as national data. Where local data are not available, however, it is often easier to estimate national data directly than it is to collect local data and sum them. For this reason the accounts will always provide national figures, but only sometimes will the data underlying them tell us about local areas as well.

International Progress on Environmental Accounts

Work on the design of environmental accounts has been underway since the 1970s. In the 1980s, UNEP, UNSTAT, and the World Bank launched a concerted international effort to build consensus on how the SNA might be modified to include the environment. This led in 1993 to the publication by UNSTAT of a draft "Handbook for Integrated Economic and Environmental Accounting," describing a preliminary methodology to be tested and refined. The approach described in this document is often referred to as the System of Integrated Economic and Environmental Accounting, or SEEA.
The SEEA attempts to integrate many of the different methods proposed for environmental accounting into a single organized framework. It proposes a series of versions or "building blocks" for the construction of the accounts, beginning with physical accounts and disaggregation of data already included in the SNA, and working towards more complex information such as calculation of depletion and estimation of the maintenance costs required for sustainable use of resources. None of the versions of the SEEA goes as far as valuation of non-marketed environmental services.

UNSTAT, with UNEP and other experts, is preparing a practical manual or workbook for implementing the SEEA. This document, which will be published in 1997, presents the same information as the 1993 SEEA handbook in a form which will make it easier for countries to test and apply.

The SEEA is a proposed methodology, and does not yet have the official approval of the United Nations. Over the next few years it is to be tested and studied further, to determine what should be part of a next version of this methodology.

National Ventures Into Environmental Accounting

Some twenty five countries have experimented with environmental accounting over the past twenty years. A few European countries have established physical accounting systems which are routinely compiled and applied to economic and environmental policy-making. Many other countries have undertaken more limited or one-time experiments and case studies with monetary environmental accounts, focused on issues such as forestry, soil erosion, and minerals depletion. A few examples suggest the richness of their experience.
· Norway has compiled physical accounts focused on energy resources and air pollution. They use these data as an input into a macro-economic model with which they explore the environmental and economic feasibility of different growth strategies.

· Indonesia was the first country for which forest depletion was calculated and integrated into a "green GDP." This pioneering work, carried out by World Resources Institute, drew the attention of both environmentalists and economists to the need to change this aspect of the SNA. Since then, the Indonesian government has been exploring options for establishing its own system of environmental accounting.

· Namibia is carrying out a phased testing and implementation of the SEEA approach to environmental accounting. It is focused on several key natural resource sectors, and is designed to answer such questions as how to allocate water among competing uses and how land degradation affects the productivity of rangeland.

· The Netherlands routinely constructs the "National Accounting Matrix Including Environmental Accounts" (NAMEA), an extended form of the national accounts input/output matrix which tracks pollution emissions by economic sector. These data are used to track how far the country is from its environmental protection objectives.

· Chile's Central Bank undertook to develop environmental accounts focusing on the forest and minerals sectors. Their work suggested that the country's forest-based development strategy may not be sustainable. The political sensitivity of this result was apparently behind a subsequent scaling back of the effort.

· Costa Rica undertook a forest depletion exercise similar to that of Indonesia; the work was carried out by the Costa Rican Centro Cientifico Tropical and the Washington-based World Resources Institute. Since then the Central Bank has taken a cautious attitude towards institutionalizing the work, agreeing to include data in the accounts if another institution took responsibility for developing them and doing the subjective valuation work required. At a 1996 workshop the consensus was that future work will place its primary emphasis on building accounts to support sectoral policy-making, rather than on calculating a "green GDP."

· The Philippines Environmental and Natural Resource Accounting Project (ENRAP) has been working on environmental accounts since 1993. Their work applies a method which treats the environment as a productive sector in the economy, and integrates the valuation of pollution impacts, non-marketed goods and services, and other economic aspects of the environment into the conventional accounts. This method differs from the SEEA in significant respects, and is somewhat controversial. More recently, the UNSD has initiated work using the SEEA methodology, which will build on some of the ENRAP data and work.

How To Get Started?

Successful work on environmental accounting depends on two crucial factors:

First, it must be focused on answering important policy questions. This ensures that the accounting work responds to a real demand for policy guidance, and is not driven simply by a desire to build databases.

Second, it must bring in the major players in the areas of environmental policy, economic policy, national income accounting, and the development of information systems on the environment, the economy, and the population. This ensures that people who could either use or provide the data required will cooperate with and support the project.

The steps below suggest the activities which may be involved in initiating work on environmental accounting:

· Learn more about the subject, by reading and where possible by talking to others with experience in the area. This learning should cover the purpose of the accounts, the policy questions which they could answer, the different methods for structuring them, and so on.

· Bring together the key players in the country and help them learn about the subject. Key players may include representatives of the national accounting office, the national bank and the ministries of environment, finance, planning, or economy; academics and researchers on economy-environment linkages; and concerned environmental or sustainable development organizations. Further decisions about the accounting project should be made by these key players as a group.

· Identify the pressing policy questions facing the country. Where is there a clear demand for better understanding of the linkages between the environment and the economy? Are specific resource-based sectors crucial to the economy? Are certain resources constraining economic development? Are pollution problems growing in importance, affecting well-being, or imposing excessive costs?

· Select a sectoral focus and areas to work on which ensure that key policy issues will be addressed.

· Choose a methodological approach (or approaches) which will be practical and will also enable the accounts to answer the key policy questions. This could involve following the methodology of the SEEA, or it could involve some combination of approaches, depending on the needs of the country and the questions to be answered.

· Select an institution to carry out the initial accounting work. While in the long run environmental accounts are likely to come under the purview of those responsible for national accounting, often those groups are unwilling to initiate the work because it is perceived as too experimental. Instead, initial work may be carried out by environment departments, government-affiliated research groups, or other players who have a strong stake in the outcome but take less risk by putting their name on experimental work. It is important that the key players agree on an institution to take charge of this activity, one which will receive the support and cooperation that the work requires.

· Build a team to compile the accounts. It is likely to include staff of the institution leading the effort, staff detailed from other key institutions, and consultants to provide technical expertise on environmental accounting or on specific issues related to the environment. Team members should have a strong grounding in economics and environmental issues, and should expect to spend substantial amounts of time looking for data and using computers
to manage and manipulate them.

· Build the first set of accounts. Like the national income accounts, environmental accounts should be produced annually, or every few years, to develop time series data; thus the accounting process is iterative. The first iteration will be a period of start-up and training, when all of the players learn what is really involved and develop a deeper understanding of the activity. The accounting team will want to set out the framework of the accounts and begin compiling the data to fill it in. This will require the development

of new communications channels, new systems for sharing information, and new mechanisms for coordinating among the players involved. While some of the data to build the accounts are likely to be unavailable, the team will have to seek all data available, use what they can find, and develop reasonable proxies for what is missing.

· Publish the initial results and disseminate them widely. Even if they are statistically weak, it is crucial to publish them and use them to explore important policy questions from the start, for several reasons. First, wide dissemination of such publications will increase awareness of the work and show how it can address policy questions. This will create additional political and social support for institutionalizing the accounts. Second, publishing initial results based on weak data is likely to help in identifying better data. Often data exist, but those who control them do not see the connections to the accounting work, or are reluctant to make them available. The more widely the results are available, the more people will see connections to other existing data and pressure will increase to make them available to the project.

· In subsequent years, the focus of the accounting work will be determined by the outcome of the first cycle of accounts. It will be important routinely to update the accounts, so that they begin to present a record of how the economy-environment linkages are evolving over time. In addition, areas where environmental costs or impacts are found to be particularly large may warrant further work or additional primary data collection. Emerging policy concerns may be introduced into the accounting framework. Special studies may be undertaken on particular questions of policy importance.