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Revision of the SEEA Experimental Ecosystem Accounting

Prepared by United Nations Committee of Experts on Environmental-
Economic Accounting

Revision of SEEA Experimental Ecosystem Accounting

The Role and Scope of SEEA EEA

Background

Since its release in 2013, the *System of Environmental-Economic Accounting 2012 Experimental Ecosystem Accounting* (SEEA EEA) has drawn many experts from many sectors and disciplines to consider the national accounting and statistical approach to the organisation of data about ecosystems and the integration of these data with standard economic information. Aside from the integration of data, one attraction has been that the core ecosystem accounting framework can be applied at a wide range of spatial scales from the national level to catchment and individual ecosystem scales. The range of applications and the wide interests of those that are now aware of ecosystem accounting has generated a complementary range of perceptions as to the precise intent and purpose of ecosystem accounting.

This note has been drafted to provide a starting point for discussion of the intent and purposes of the SEEA EEA and hence to establish clear expectations from the process of revising the SEEA EEA that is now underway. Following an introduction to ecosystem accounting, this note describes the nature and the benefits of the SEEA EEA, the scope and focus of the SEEA EEA and the aims of the SEEA EEA revision process that has recently commenced with a completion date of end 2020.

Introduction to accounting for ecosystems

The general purpose of accounting for ecosystems is to provide decision makers with broad, coherent and comparable information about (i) the changing composition and condition of ecosystems and their biodiversity and (ii) the ecosystem services they provide to economic units, including households, and society as a whole.

The application of accounting principles encourages measurement of both the *stock* of ecosystem assets and the *flows* of ecosystem services. In turn, this encourages assessment of the trade-offs that arise between alternative uses of ecosystems, including terrestrial, inland waters and marine areas, and promotes the monitoring and evaluation of changes in the quality or condition of those ecosystems over time.

Ecosystem accounting information directly supports the discussion of environmental sustainability and resilience and provides inputs to the broader discussion of sustainable development. This extends, for example, to supporting the discussion of the 2030 development agenda and the derivation of SDG indicators.

A core motivation for ecosystem accounting is that separate analysis of the economy, on the one hand, and ecosystems and biodiversity on the other, does not adequately reflect the embodied relationship between humans and the environment. Conceptually, ecosystem accounting approaches reflect a nested systems perspective (economy in society in nature) and can support approaches that assess systems in terms of changes in a full range of stocks and flows.

One set of such approaches are known as multiple capital based approaches, one example being wealth accounting. These approaches bring together information on stocks of produced

capital, natural capital, human capital and social capital to underpin assessment of various system-wide outcomes and impacts.

The general approach to ecosystem accounting in examining ecosystem stocks and flows has been described in a range of documents in varying ways. Relevant examples include work on inclusive and comprehensive wealth (UNEP and World Bank) and TEEB (UNEP). The underlying economic logic for ecosystem accounting should therefore be considered to be well established.

The nature and benefits of SEEA EEA

SEEA EEA as a statistical document

The SEEA EEA was drafted as a complement to the SEEA Central Framework, the international statistical standard for accounting for the relationship between the economy and the environment. Both documents apply the accounting principles of the System of National Accounts (SNA) which is the international statistical standard for the measurement of economic activity and wealth and includes, for example, the internationally agreed definition of gross domestic product (GDP). A prime motivation for the development of the SEEA from the early 1990s were the widespread concerns about the focus on GDP as a measure of progress.

By its origins, SEEA EEA is a statistical document produced and managed by the community of official statisticians under the direction of the United Nations Statistical Commission. The connection to official statistics is fundamental as it places the SEEA EEA within the broader body of work on official measurement. This brings with it a range of requirements and practices in terms of establishing agreed measurement boundaries, terms and definitions, classifications and a general interest in the organisation of data to provide a detailed record of social, economic and environmental phenomena.

Thus, the SEEA EEA is a document that provides a detailed description of the relevant concepts, definitions, measurement boundaries, accounting principles, accounts structures, classifications and related issues that collectively represent the SEEA's ecosystem accounting framework.

Since the SEEA EEA is based on established national accounting principles and concepts and has been developed in the broad framing of official statistics, it is designed to support the organisation of ecosystem related information in a manner that allows for its integration with standard economic, financial and social data. In turn, this supports the broadening of economic discussion and analysis beyond standard measures of production, income and economic assets.

Indeed, one distinguishing feature of the SEEA EEA that stems from its basis in national accounts is the potential to integrate ecosystem and economic data in a single accounting system and hence bring ecosystem data directly into economic decision-making tools and processes. Making the connection to economic information is considered of particular importance in the formation of environmentally sustainable economic policy. In addition, it is increasingly relevant in environmental policy to enable those charged with maintaining and restoring environmental condition to (i) better explain the rationale and performance of environmental policies in economic terms, and (ii) develop policy that engages with the activities of the private sector, particularly in their role as land managers.

Therefore, beyond its role in the organisation of data, the SEEA EEA framework supports a more informed discussion of the connections between people and the environment and helps to structure a narrative about these relationships using the same language and framings used in economic and financial discussions.

Tasks the SEEA EEA does not cover

While the SEEA EEA provides a comprehensive description of the SEEA's ecosystem accounting framework, there are a number of information related tasks that the SEEA EEA does not cover. These tasks are:

- The SEEA EEA does not provide specific guidance on the choice of datasets or methods since these are likely to vary by country and region and indeed, will likely change over time as new datasets are developed. Within the official statistics system, conceptual standards and documents such as the SNA and the SEEA, are generally complemented by supporting materials such as compilation guidance, training sessions and technical support that collectively allow each country to advance the development of accounts and statistics using the resources they have available.
- The SEEA EEA is not, of itself, a database with standard data collected from all countries of the world. The definitions and classifications of the SEEA EEA will support the development of such a database in the future in the same way as the SNA supports the development of a standard dataset of economic activity.
- The SEEA EEA does not prescribe specific applications of accounting data and instead should be seen as supporting the organisation of a coherent information base that can, in turn, support a wide variety of applications including ecosystem assessment, cost-benefit analysis, risk assessments, system-based modelling, scenario assessment and forecasting and trade-off analysis.
- The SEEA EEA does not prescribe a set of indicators for the monitoring of environmental performance or other policy actions. Indicators must be selected on the basis of discussions among stakeholders and will particular consideration of the policy objectives and targets. At the same time, the SEEA EEA provides the definitions and classifications that can support the improved and coherent definition of indicators. Further, there are a range of accounting aggregates that are embodied in the accounts of the SEEA EEA that may be used as indicators in their own right, much as GDP is an indicator that emerges from the SNA. Examples of such aggregates include degradation adjusted measures of GDP, changes in extent (area) of ecosystem types, gross ecosystem product (GEP) of ecosystem services, changes in ecosystem condition by ecosystem type.

This list of tasks that the SEEA EEA does not cover is exactly the same as for the SNA, the SEEA Central Framework and other statistical standards and its specific focus should not be seen as diminishing its significance or role. It should become clear that without a document such as the SEEA EEA to provide a common language for ecosystem information, the development of measurement guidance, the collation of data, the running of applications and the derivation of indicators would be a much more ad hoc series of tasks with no “glue” that supports comparability across countries or over time.

The scope and focus of SEEA EEA

There are range of topics that have emerged in discussions with various stakeholders and experts with an interest in SEEA EEA concerning the scope and focus of SEEA EEA. Four of the most commonly identified topics are discussed in this section with the aim to provide a better basis for discussion and to start the process of reducing misconceptions among different approaches to environmental measurement.

Links to SNA and SEEA Central Framework

As noted above, the SEEA EEA should be seen as a complement to the accounts of the SNA and the SEEA Central Framework. In the SEEA Central Framework the focus is largely on distinct or separate environmental stocks and flows, such as water, energy, soil, land and emissions, and describing the ways in which each stock or flow can be recorded using accounting principles and in a manner that aligns with the SNA.

In the area of environmental assets, the SEEA Central Framework mirrors the SNA in a focus on individual environmental assets, such as timber, fish, minerals and energy resources, land, etc, accounting for each in turn and undertaking valuation only to the extent of the value of resources extracted or harvested.

The SEEA EEA considers the same environmental assets as the SEEA Central Framework, except for mineral and energy resources, but aims to account for them in terms of how they function collectively. To do this, the approach is to consider individual ecosystem assets each defined by an agreed spatial area (e.g. a forest or wetland) and within which the various environmental assets operate as a system. The focus on different types of ecosystem assets supports organisation of information on the change in extent (area) and the change in condition of the assets. This is undoubtedly a stylised version of the ecological reality but it has proved very useful for the organisation and presentation of data. Note that the coverage of environmental assets in the SEEA is somewhat broader than in the SNA since the SEEA (both EEA and Central Framework) includes areas of land that may not provide a current stream of economic benefits.

The SEEA EEA then goes beyond the SEEA Central Framework to recognise not only ecosystem services related to extracted or harvested resources but also ecosystem services that are not generally sold on markets and hence are not captured in traditional measures of production and income. In turn, this extension of the income and production boundary, leads to an expanded conception of wealth since the underlying environmental assets are recognised to provide a much wider set of benefits than is traditionally recognised.

While the precise relationship between these three statistical frameworks is not straightforward to describe, a key point is that data on any of the environmental assets in a given location and a give point in time should be consistently recorded in all three accounting systems. Thus, for example, the volume of timber in a forest is a measurement that should apply equally in the SNA, SEEA Central Framework and SEEA EEA accounts. Recognising and consistently recording data across the accounts is a key part of the accounting process and also a fundamental aspect of the design of the frameworks.

Spatial scale for ecosystem accounting

Official statistics is a discipline that starts from the general ambition to provide a set of data at national scale. Thus, in line with its origins, the general ambition in the design of the SEEA EEA is to support the organisation of ecosystem data across a country. In particular, this ambition means that the SEEA EEA has an interest in accounting for multiple ecosystem types and multiple ecosystem services.

In practice, to date there have been only a few examples of the SEEA EEA being applied at national scale. These include the Netherlands, the UK and Uganda. Instead most work has been conducted for jurisdictional/administrative units or environmental areas within a country, such as a catchment.

Conceptually, the accounting principles used in the SEEA EEA can be applied at all spatial scales. Just as one set of national accounting principles is applied to both large and small countries (to both USA and Tonga for example), so can the ecosystem accounting principles in the SEEA EEA be used at relatively fine spatial scales. Thus SEEA EEA based accounting can

be undertaken to provide information to support decision making by, for example, farmers, managers of protected areas and local communities. Further, since the accounting concepts are aligned across scales, the information sets compiled through ecosystem accounting at fine and larger scales should be, in concept, consistent and coherent. That is, there should be the potential to establish micro-macro linkages.

The compilation of ecosystem accounts may be undertaken using detailed spatial data or using more aggregated data (or a combination of data sources), the choice being dependent on the types of decisions and analysis of interest and the data available. Given the general ambition noted above leads to a focus at the national or large area scale, the descriptions in the SEEA EEA will tend to relate to measurement approaches that are relevant for supporting reporting and decision making at those scales.

For example, it would be reasonable to expect that data from national and large area scale accounts can be used to identify those areas within a country where there may be particular concerns about a loss of ecosystem condition or changes in ecosystem services supply. Based on this initial broad scale assessment, further investigation could be undertaken to collect more detailed data on those specific areas to understand the situation in more depth and develop appropriate policy responses. These additional investigations need not require the development of additional accounts at finer scale but rather could be seen as being undertaken within the framing provided by the more macro-scale accounts. In economic analysis a parallel could be drawn to using the national accounts to identify industries within the economy that are performing relatively poorly and then conducting specific analysis, perhaps in particular target regions, to determine the appropriate policy response.

Valuation and ecosystem accounting

A key aspect of the SEEA EEA and its potential to integrate with economic data concerns estimates of ecosystem services and ecosystem assets in monetary terms. Importantly, monetary valuation is not a mandatory requirement for the use of the ecosystem accounting framework, nor is there an ambition in the SEEA EEA to provide a single estimate of the “total value of nature”. Indeed, the initial focus in SEEA EEA is to use the ecosystem accounting framework to organise biophysical data concerning stocks and changes in stocks of ecosystem assets (including degradation) and flows of ecosystem services. Biophysical data organised in this way provides a substantial and harmonised information base for all decision makers.

The SEEA EEA approach to monetary valuation applies the exchange value concept of the national accounts, i.e. the value at which ecosystem services would be exchanged if a market existed. The use of exchange values allows ecosystem service and ecosystem asset values to be compared to, and directly integrated with, the estimated values of assets and income recorded in the standard national accounts. These valuations thus support the derivation of aggregates such as degradation adjusted measures of national income and broader measures of national wealth. Exchange values also support direct incorporation of ecosystem services and assets into estimates of multifactor productivity, and input-output and general equilibrium analysis.

While for the purpose of integrated accounts there is a requirement to use the exchange value concept, in many cases there is interest in valuations of ecosystem services and ecosystem assets that incorporate social costs and benefits and are more focused on the assessment of changes in welfare. For these purposes, the ecosystem accounting data in biophysical terms can provide a common starting point. Then, through the use of alternative valuation concepts or different assumptions concerning institutional arrangements, complementary valuations may be obtained to support decision making.

While these complementary welfare-based valuations will be different from the estimates obtained from the SEEA EEA framework, together they will provide information to support discussion of a wide range of policy and analytical questions. Indeed, a direct comparison of exchange values (based on existing institutional arrangements) and other valuations based on alternative assumptions, may provide clear messages on the size of the economic effect of current institutional arrangements. The revised SEEA EEA will aim to place all valuation approaches in a common context to best support decision makers.

Social aspects

The economic and accounting origins of ecosystem accounting lead to the common perception that the intent of SEEA EEA is to organise information in such a way as to only inform what may be referred to as an instrumental values based perspective on the relationship between people and the environment. This perspective considers that that relationship is characterised by the benefits that people receive from the environment. An alternative perspective is an intrinsic values based view wherein the environment has value in and of itself. Other approaches to considering this relationship are also being recognised, for example in the form of stewardship, within the broader construct of relation values.

It is clear that the general framing of ecosystem accounting is well aligned with an instrumental values or utilitarian perspective. From the perspective of the SEEA EEA this is further reinforced in the use of exchange values when compiling ecosystem accounts in monetary terms. Thus, the use of exchange values will tend to exclude the non-use values of ecosystem assets and the inclusion of bequest and existence type values may also be limited. This is, of course, consistent with the scope of the standard national accounts but, for certain questions, it will limit the applicability of SEEA EEA based monetary accounts.

However, it is also the case that the biophysical accounts of the SEEA EEA, in particular accounts for ecosystem condition, may be able to provide an important body of information to consider alternative non-instrumental perspectives. For example, if the change in the condition of an ecosystem is assessed relative to a reference condition that is considered natural then, implicitly, the condition assessment reflects an intrinsic values perspective.

More discussion on the topic of how SEEA EEA data can be used to support discussion of alternative perspectives on value is required. It is anticipated that such a discussion can be integrated within the same discussion which is taking place within the work of the IPBES and its related framing of nature's contribution to people. It is not intended that the SEEA EEA step away from monetary valuation in exchange value terms but, as with many aspects in the ecosystem accounting space, it is important that various pieces of information can be placed in the correct context so as to best ensure informed decision making.

Aims of the SEEA EEA revision process

Given the nature of the SEEA EEA as a statistical document outlining agreed concepts, definitions, classifications and accounting principles, the revision process will focus on these aspects. The starting point is the original SEEA EEA endorsed by the UNSC in 2013 but this will be further informed by the subsequent research and testing work at national and sub-national level and the summary of progress reflected in the SEEA EEA Technical Recommendations released in December 2017.

In terms of process, the SEEA EEA revision will follow the approach of work on the development of statistical standards and documents by establishing a set of specific revision issues, undertaking initial research, working through progressive rounds of consultation and review, the drafting of revised chapters and ultimately, consideration of the completed document by the UNSC.

Beyond making advances in the conceptual clarity of the SEEA EEA, there are three other opportunities that arise through the revision process. The first is the opportunity to substantially broaden the community of experts who provide input and insight into the design of the SEEA EEA. The original SEEA EEA had relatively limited input from ecologists and environmental economists and engaging closely with these communities is a particular aim.

Second, the release of the SEEA EEA in 2013 has served as a platform for showcasing a wide range of ecosystem measurement work and, increasingly, is proving a catalyst for projects at national, sub-national and local scales. The provision of a common language that is not dependent on the use of standard method or modelling approach has been of particular benefit in this regard. It is anticipated that the revision process over the coming two years will provide an important opportunity for the refined concepts, definitions and classifications to be tested and the overall feasibility of ecosystem accounting to be assessed.

Finally, and consistent with the general intent of this note, there is a real opportunity for the SEEA EEA revision to contribute directly to placing in context the wide range of approaches to environmental measurement that are currently in play. While all of these approaches have valid rationales and play different roles, the sheer variety is generally overwhelming for decision makers whose primary concern is often not environmental sustainability. The opportunity to articulate pathways towards improved decision making is one that will be of particular focus through to 2020.