London Group on Environmental Accounting, 30th meeting

30 September -04 October 2024

Title:

A constructive comparison across the Atlantic to implement and use Natural Capital Accounts

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Abstract

This paper focuses on advancing the effective use and application of Natural Capital Accounts to inform environmental and natural resource management decisions. In addition, the paper seeks to enhance connections between NCA use and NCA development, production, and expansion. The connection of NCA use and development is critical to the viability and sustainability of NCA within the UN System of Integrated Environmental and Economic Accounts – Ecosystem Accounting (SEEA EA). The paper builds on collaboration between Europe's and the United States' researchers and practitioners to compare and learn from work on both sides of the Atlantic when implementing and operationalising the UN System of Integrated Environmental and Economic Accounts – Ecosystem Accounting (SEEA EA). The paper addresses three specific topics within this area. The first topic is **governance** and addresses issues relating to the current and future status of NCA development and use in the EU and the US. How do efforts across different entities and levels of government vary and how does the private sector fit in? It will also assess the peculiarities of both the US and the EU's structure and administration. The second topic assesses the **systematic production** of ecosystem accounts and addresses issues on the evolution from a general framework with experimental applications to an operational approach. In moving to an operational approach, how can results from modelling in SEEA be most effectively reported and analysed to inform decision makers? Discussion about data including availability through Earth Observation and the need for data estimation that includes issues relating to data reliability and modelling robustness will also be discussed. The third topic focuses on **policy uses** and includes the development of a vision for routine applications of NCA for environmental and economic decisions. What is the longer-term vision for informing decision-making using a more comprehensive set of metrics and how can opportunities and challenges be identified and described? In addition, how do policies relating to monetization of ecosystem services affect the demand for and potential use of NCA? How can natural capital information including baselines and counterfactuals be considered in terms of alternative decisions and policies?

1. Introduction

The European Union (EU) and the United States (US) are both exploring ways to develop Natural Capital Accounts consistent with the System of Environmental and Economic Accounts – Ecosystem Accounts (SEEA EA).

The vision highlighted in this paper is that a system of natural capital accounts has value both in its existence and in its use. Even if NCA are not explicitly used, their existence has value in their availability and their potential to inform decisions. Of course, NCA's value can become much greater if they are used to inform decisions and to monitor the effectiveness of decisions that have been made. The point is that a system of NCA accounts needs to be developed before they can be used. And that development affects their existence value. The application of NCA affects their use value.

To take stock of advancements across both sides of the Atlantic, in 2021, a special issue of the journal *Ecosystem Services* published a set of research papers describing EU and US experiences developing and using Natural Capital Accounts (NCA): "Accounting for Natural Capital: lessons learned from applications in Europe and the United States" (https://www.sciencedirect.com/special-issue/10RZK17R0JP). Subsequent to the publication of the special issue, EU and US scientists and practitioners organized a series of discussions and meetings to advance collaborative efforts between the EU and the US to share practices on NCA.

This dialogue included participation in conferences in the EU and in the US: in Washington D.C. at the ACES (A Community on Ecosystem Services) 2022 conference ("Applying Natural Capital Accounts in the European Union and the United States: A Synthesis," ref. https://conference.ifas.ufl.edu/aces/prior/aces22/documents/ACES-2022-Detailed-Agenda.pdf) and in Limassol, Cyprus in 2023 at the European Association of Environmental and Resource Economists (EAERE) conference ("Exploring the policy uses of Natural Capital Accounting: a dialogue across the Atlantic," ref. http://www.eaere-conferences.org/index.php?p=369).

To continue the dialogue, a series of online meetings was held to explore opportunities for collaboration relating to three specific topics important to advancing the development and use of NCA: (a) Governance; (b) From pilot to systematic production; and (c) Possible policy uses. This paper summarizes the outcomes from the online meetings and highlights the findings that emerged from comparison of both experiences. Indeed, the results can provide insights for other countries that are planning to develop and implement an NCA system and need to decide what to do and how to proceed.

We are grateful to all participants in the online meetings that took place between the end of 2023 and the beginning of 2024 and acknowledge their substantial contribution in advancing reflections and ideas included by the Authors of this paper. Of course, Authors of this paper bear entire responsibility for the ideas and concepts expressed.

2. From pilot to systematic production

The natural capital system is a complex entity, comprising numerous modules/components that need to be accounted for. A testing phase is required to ascertain the optimal methodology and subsequent course of action. The initial point of reference for pilot applications in both the US and the EU is the System of Environmental and Economic Accounts – Ecosystem Accounts (SEEA EA), which provides a comprehensive framework, reference classifications and a series of accounting formats. Based on a

general framework, practitioners require operational procedures to compile ecosystem accounts, and the development of operational procedures can be undertaken in a variety of ways, as evidenced by differing experiences across the Atlantic.

In the EU, there were three different channels of practices to test the SEEA EA modules: extent, condition and services. The testing phase in the EU, started with a major initiative, the INCA (Integrated system for Natural Capital Accounting) project. The INCA project is a top-down initiative that put together different European institutions to test and implement the SEEA EA. Eurostat steered the testing phase together with the European Environment Agency as data provider, the Joint Research Centre as scientific hub, DG Environment as the policy actor and DG Research and Innovation for enhancing synergies with relevant EU-funded research projects. INCA has been articulated in two phases starting in 2015. At the end of the first five years, INCA released ecosystem extent accounts and nine ES accounts for the 27 European Union member states and it is now contributing to produce and validate most recent data. Another avenue for carrying out the testing phase was led by Eurostat through providing grants to EU National Statistical Offices to test and implement SEEA EA modules. This set of applications is bottom-up within the context of statistical offices. In addition, DG RTD through the Horizon Europe programme funded a research project called MAIA where European practitioners and researchers tested different SEEA EA modules. Once again, it is a bottom-up set of applications mainly in an academic context.

As a result of this testing phase, the EU adopted a regulatory approach through the amendment of the EU Regulation on European environmental economic accounts, introducing ecosystem services accounts, largely based on the results and lessons resulting from INCA outcomes, which introduces Ecosystem services. However, it also relies strongly on so-called extent accounts produced by the

Initial NCA development efforts in the US began in the 1990's with work on mineral accounts. In 2016, a spontaneous and ad hoc collaboration of scientists, practitioners, and managers initiated an effort to develop experimental accounts for land, water, and ecosystems, resulting in preliminary accounts for these types of natural capital. In addition, separate efforts in the US were initiated to develop satellite accounts relating to Oceans and Outdoor Recreation.

In 2002 and in 2008, the H. John Heinz III Center for Science, Economics and the Environment published "The State of the Nation's Ecosystems." The reports were an effort to formalize the reporting of status and trends of the US ecosystems by identifying strategic indicators of the condition and use of US ecosystems and laying the groundwork for periodic, high-quality, and non-partisan reporting. The report contained highly visible useful information and remains an important resource to researchers and policymakers interested in environmental statistics.

In 2022, the White House and the Department of Commerce established an Interagency Policy Working Group to develop the U.S. National Strategy. It then evolved into the Policy Working Group on NCA, with the goal of establishing coordination among agency leaders and began to develop the NCA strategy. The process moved into more technical work with the organization of the Council of Account Leads, which provides coordination between the technical leads for each account, and the Interagency Technical Working Groups, which are more task-specific (e.g. classification, assessment, data sharing). In the US, the NCA strategy establishes a phased approach characterised by the work of 27 different offices, agencies and departments on the overall SEEA modules (including both the Central Framework and the Ecosystem Accounts). Three main phases on environmental sectors (such as land, water, air emissions, marine natural capital) are accompanied by supporting activities (such as data sharing protocols and valuation standards). The purpose of the phases is to prioritize what is needed and at what pace: depending on the phase, the pilot phase may actually end in 2025 (phase I

environmental sectors), 2027-28 (phase II environmental sectors) or 2031 (phase III environmental sectors). After the pilot phase, more mature releases leading to prototype accounts are envisaged before moving to the official statistical products fully endorsed by the scientific and statistical community in the US. The time horizon for the completion of all accounts is the year 2036.

The different actors (offices, agencies and departments) may play different roles (i.e. lead or supporting agencies) depending on the account (e.g. forest accounts, emissions accounts) and the action to be taken (e.g. biophysical data provider vs. monetisation vs. compilation and normalization).

3. Governance

The European Union and the United States have different institutions and policies concerning the development and management of NCA.

In the EU there is a centralized system with a coordinating agency, Eurostat, the European Statistical Office. Eurostat is a Directorate-General of the European Commission that collects and publishes statistical data for the EU. In this capacity, Eurostat manages and collects NCA applications across the EU. There is partnership between the Eurostat and National Statistical Offices (NSOs) in every EU country. In fact, most statistical data in the EU are collected by the EU Member States, therefore Eurostat also provides guidelines to further develop consistency and availability across National Statistical Offices (NSOs).

The EU is awaiting the imminent publication of the amended Regulation for environmental economic accounts that already received the approval from EU co-legislators. Since Ecosystem Accounts become mandatory as of 2026 in the EU, Eurostat supported by National Statistical Offices is now focussing its efforts in providing Guidelines and Tools to support EU Member States. For the overall production of Ecosystem Accounts in the 27 Member States, Eurostat will make available: guidelines, tools, training sessions and materials in view of harmonising results across the EU.

In the United States, there is a decentralized system where the development of environmental statistics is distributed across a number of government and non-governmental organizations with environmental or natural resource responsibilities. There is no uniform set of statistics relating to the environment, nor is there a lead agency. Several science and environmental agencies have independent responsibility for collecting and developing environmental statistics.

In January 2023, the White House released the “National Strategy to Develop Statistics for Environmental-Economic Decisions.” The Strategy calls for a U.S. system of natural capital accounts and associated environmental-economic statistics. It explicitly highlights their importance in informing government decisions.

The Strategy includes plans for Federal agencies to collect and develop environmental-economic statistics and to formalize this process. The different actors (offices, agencies and departments) may play different roles (i.e. lead or supporting agencies) depending on the account (e.g. forest accounts, emissions accounts) and the action to be taken (e.g. biophysical data provider vs. monetisation vs. compilation and normalisation). The NCA strategy provides for an implementation plan for each account, with the aim of building a consensus that is not agency-specific but government-wide, i.e. shared best practices across the federal government. While there is a great deal of diversity among the various agencies and departments, nevertheless a Chief Statistical Office within the Office of Management and Budget (OMB) bears responsibility for the statistical coordination process.

Both the EU and the US are advancing plans to improve NCA through coordinated planning and in doing so are establishing momentum to make systematic production of such accounts happen (the US National Strategy and proposed legislation in the EU). Although efforts on both sides of the Atlantic cite the importance of applications that use NCA to inform decisions, the sustainability of efforts to develop and populate NCA databases requires that coordinated efforts to expand the use of NCA in public and private decision making are included in the institutions and the governance associated with environmental-economic statistics. The existence of NCA does have important value; however, the value in use will result in significant and visible benefits that will be required to sustain NCA development and use efforts.

4. Policy uses

Although the pace of production of full-fledged Natural Capital Accounts differs in the US and the EU, in practice the actual use of such accounts in public policies is still quite limited across both sides of the Atlantic. In fact, the EU has a considerable time advantage when we consider the production of NCA, with EU Member States starting the production phase as of 2026, according to the amended Regulation (soon entering into force), whereas the US are still carrying out an articulated stepwise pilot until 2031, successively covering different environmental domains, before starting the proper production.

The most straightforward applications for Natural Capital Accounts concern the support to specific environmental policy making, with a management perspective, to be taken at different levels, often at the local one. These range from assessing and containing forest wildfire risks or defining the level of forest payments considering sustainability issues or the restoration of degraded ecosystems across a country, using a partial equilibrium perspective. In most cases, decision-making at local level will use such accounts for Benefit-Cost Analysis or Impact Assessment.

However, the attractiveness of producing such environmental economic accounts lies in structuring environmental information in an accounting framework that can connect to conventional national accounts. Both for the US and in the EU the use of Natural Capital Accounts in economic and financial affairs can be enhanced, if accounts were to be further developed by sectors of the economy, in order to be able to be integrated into macro-economic accounts and modelling. This would enable a more sensible budget forecasting and Debt Sustainability management, which would take into account both the depletion of natural resources and the contribution of ecosystem services. Once these accounts will be produced by all countries, then applications in trade policy would also be promising, as well as the assessment of ecosystems contribution to price stability or financial stability that takes into account both climate and biodiversity risks.

The integration into macro-economic models implies that accounts are not only calculated in biophysical, but also in monetary terms. In line with their Strategy, the US have pushed for monetary accounts since the beginning of the testing and then the piloting phase, whereas in the EU monetary valuation has not been central in the implementation of the amended Regulation. Having said this, in the final text of the amended Regulation, monetary valuation has been spelt out explicitly as a possible further development.

The future use of such accounts may depend on the involvement of different branches of government. At present, there seems to be a diverse level of awareness of the potential of Natural Capital Accounts in decision-making, depending on the actors involved in the piloting phases. In Europe, the steering role was played by Eurostat that was mandated to steer the development and deployment of

Ecosystem accounts, with the support of the Member States' National Statistical Offices. By their very nature, they have been playing a technical role, with the policy one, which was essentially played by the Directorate General for Environment (DG ENV) of the Commission. A game-changer is the relatively recent involvement of other European Commission's departments, especially the one for Economic and Financial Affairs (DG ECFIN) and the Working Group represented by Member States experts. In the US the involvement of 27 Government Departments and agencies, including statistical offices, providing technical contributions, seem to have spread awareness about these accounts at different levels of the administration, notably those in charge of economic policy.

5. Conclusions

The dialogue across the Atlantic has resulted in several key findings. These include:

1. **Collaboration efforts are important to advance NCA production and use.** There are great opportunities for developing an operational set of NCA that can inform decision making in the EU and in the US. There are also significant challenges that remain. Sharing experiences and ideas can help efforts to move forward in NCA implementation. The collaboration between the EU and the US could be expanded to include other nations that have similar opportunities and challenges.
2. **Governance is an important factor in advancing NCA implementation.** It requires top-down efforts such as the proposed legislation in the EU and the National Strategy in the US. Without support at the policy level, efforts at the scientist or decision maker level will not advance as quickly and as fully. However, bottom up efforts are also needed. Scientists and decision makers need to capitalize on opportunities to advance the production and use of NCA. Efforts like the INCA project in the EU and the ad hoc NCA project to develop experimental accounts in the US are critical to advances, even with top-down support.
3. **Expanded efforts and research are needed to develop NCA applications to inform decision makers**. Data alone does not produce value. In many cases, research is needed to develop improved ways of applying data including NCA. This effort requires partnerships between scientists, managers, and information scientists. In this way, improved methods of applying NCA can be developed to inform decisions and to monitor trends in NCA. There are challenges in developing important uses of NCA before NCA is operational. However, it is critical that applications be explicitly considered even in the planning phase so that benefits can be achieved quickly.
4. **The NCA community needs to be broad, including scientists, practitioners, and decision makers from the physical, biological, economic, and social sciences disciplines.** The community needs to expand to include people beyond the environmental community. To be sustainable, it also requires demanders of NCA as well as suppliers. The community needs to include potential NCA users that are not involved in its production, but understand the importance of applying NCA to inform decisions and trade-offs.