

ENVIRONMENTAL ACCOUNTING

Environmental economic accounts and
their role in audits on biodiversity and
other environmental and sustainability
topics

Environmental Accounting: environmental economic accounts and their role in auditing biodiversity and other environmental and sustainability topics

Prepared by: United Nations Environment Programme - Brazil Office (UNEP-Brazil)

Authors

Raquel Agra,¹ Steven King¹

Co-authors

James Vause,¹ Matheus Couto,¹ Rodrigo Cassola¹

¹ United Nations Environment Programme World Conservation Monitoring Centre (UNEP-WCMC)

External Reviewers

Marcio Verde-Selva,² Christiane Holvorcem,³ Adriano Martins Juras,⁴ Dashiell Velasque da Costa,⁴ Elisângela Papst,⁴ Marcos Rezende de Campos Souza⁴

² United Nations Environment Programme (UNEP)

³ *Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH*

⁴ Federal Court of Accounts (TCU-Brazil)

Legal notice

Copyright 2021 United Nations Environment Programme

The United Nations Environment Programme World Conservation Monitoring Centre (UNEP-WCMC) is the specialized biodiversity center of the United Nations Environment Programme, the world's leading intergovernmental environmental organization. The Centre has been in operation for over 40 years, combining scientific research with practical policy advice.

This publication may be reproduced for educational or non-profit purposes, provided that reference is made to the source. The reuse of any figures is subject to the permission of the original rights holders. No use of this publication may be made for resale or any other commercial purpose without the written permission of the UN Environment Programme (UNEP). Permission requests, with a statement of purpose and extent of reproduction, must be sent to the Director, UNEP-WCMC, 219 Huntingdon Road, Cambridge, CB3 0DL, UK.

The contents of this report do not necessarily reflect the views or policies of UNEP, contributing organizations or publishers. The designations employed and the presentation of material in this report do not imply the expression of any opinion whatsoever on the part of UNEP or the contributing organizations, editors or publishers concerning the legal status of any country, territory, city area or its authorities, or concerning the delimitation of its frontiers or boundaries, or the designation of its name, frontiers or boundaries. The mention of a commercial entity or product in this publication does not imply endorsement by the UNEP.

This initiative was carried out within the framework of the Regional Project for Strengthening External Control in the Environmental Area, a partnership of the German Cooperation for Sustainable Development (through GIZ - Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH), the TCU, and OLACEFS, with the support of the German Federal Ministry for Economic Cooperation and Development (BMZ).

Cover photo: Aerial view of the Amazon Forest, near Manaus (Amazonas, Brazil)

Contents

Preface	3
Presentation	6
Acronyms and abbreviations	7
Glossary	9
1. INTRODUCTION	11
1.1. National accounts and environmental accounting	12
1.2. Methodology of environmental economic accounts.....	12
1.3. Contributions of the accounts in the planning, monitoring and evaluation of public policies	17
1.4. Accounts contributions to the biodiversity agenda, the 2030 agenda and other global sustainable development agendas.....	17
2. ENVIRONMENTAL ACCOUNTING ES LAC	19
2.1. Accounts overview	20
2.2. Contributions of the Accounts to public policies in the region.....	27
3. USE OF ENVIRONMENTAL ACCOUNTING IN ENVIRONMENTAL AUDITS	30
3.1. The role of environmental audits	31
3.2. Importance of using environmental accounts in international and national environmental audits	32
3.3. The use of accounts for the different audits.....	33
Thematic Applications.....	33
Sustainable Development, Integrated Planning, the SEEA and relationship with Environmental Audits	40
4. FUTURE PERSPECTIVES IN THE USE OF ENVIRONMENTAL ECONOMIC ACCOUNTS IN ENVIRONMENTAL AUDITS.....	42
References	45
Attachment 1. Recommended Bibliography	48
Attachment 2. Websites.....	51
Attachment 3. Initiatives	54

Preface

Dear readers,

Conceived in the period following the United Nations Rio-92 conference, environmental accounting systems have been continuously developed in order to quantify and assign monetary values to the stocks of environmental assets and the flows of ecosystem services they provide. This information, which is not adequately considered in the Systems of National Accounts (SNAs) and in the calculation of traditional macroeconomic indicators such as GDP, is essential for policy makers to be able to rationally assess, in economic terms, not only the benefits, but also the negative environmental consequences, such as the destruction or degradation of environmental assets and the loss of ecosystem services, as a result of past, present, and proposed or planned development policies

Environmental accounting, now formalized in the international standards of the System of Environmental Economic Accounting (SEEA), has been gradually adopted by different countries, and today the vast majority of LAC countries already have legal frameworks for environmental accounting and/or SEEA in operation. However, much remains to be accomplished in this field in the region, especially in the implementation of Ecosystem Accounting (EA), which just had its international standard approved by the United Nations in March 2021.

The German Cooperation, through the *Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH*, has been supporting the implementation of SEEA in Brazil. Among the efforts in this direction, we can highlight the discussion held throughout 2018 within the scope of the TEEB Regional-Local Brazil-Germany bilateral cooperation project, on the contribution of environmental accounts for water, forests and energy to sectoral public policies and to the strategic planning of the Brazilian government.

On the other hand, the Supreme Audit Institutions (SAIs), external control bodies responsible for evaluating the appropriate use of government resources and the effectiveness of public policies, have turned their attention strongly to audits on environmental issues, recognizing their importance for sustainable development, for the preservation of the natural heritage of countries, and for compliance with international agreements such as the Convention on Biological Diversity (CBD) and the 2020 Agenda for Sustainable Development, among others. In this sense, GIZ supported coordinated audits involving member SAIs of the Latin American and Caribbean Organization of Supreme Audit Institutions (OLACEFS), as part of the regional project for Strengthening External Control in the Environmental Area, on various environmental issues, such as protected areas and renewable energy.

Environmental economic accounts have great potential to facilitate and extend the depth and scope of audits on environmental issues, as recognized in a 2010 publication by the International Organization of Supreme Audit Institutions (INTOSAI). Indeed, the availability of up-to-date environmental accounts calculated using standardized and reliable methodologies will significantly simplify data collection processes by SAIs when conducting environmental audits.

This publication, developed as a product of a partnership between GIZ and the United Nations Environment Programme (UNEP), aims to contribute to the capacity building of SAIs in Brazil, the Federal Court of Accounts (TCU-Brazil), and other member SAIs of OLACEFS, in the use of environmental accounts in environmental auditing processes. We hope that the use of this new tool will allow SAIs to continuously improve the quality of their environmental audits, in order to induce positive changes in the public administration of different countries and harmonize the social, economic and social aspects of public policies, in the common effort to meet the Sustainable Development Goals of the United Nations 2030 Agenda.

Have a good read everyone.

Jens Brüggemann

Director of the Biodiversity, Forests and Climate Programme

GIZ in Brazil

Presentation

This report was prepared by the United Nations Environment Programme World Conservation Monitoring Centre (UNEP-WCMC) in coordination with the United Nations Environment Programme's Brazil Office (UNEP-Brazil), in the context of the project *Strengthening external control in the environmental area,* commissioned by the German Federal Ministry for Economic Cooperation and Development (BMZ) and implemented by the German Cooperation through the *Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH*.

Environmental accounting is an initiative to account for nature's assets, such as water, forests, energy, and ecosystems, among others, in a way that presents the benefit flows they provide to the economy and society. It provides a framework for organizing information about these natural assets so that it can be linked to economic data. Among other uses, environmental accounting can help decision-makers to manage natural resources more sustainably, to assess the impact of different policies and regulations on ecosystems, to analyze development policies in an integrated way, and to define ways to balance economic activities with environmental sustainability.

This report aims to provide background and strengthen auditors' technical capacities, so that environmental accounting is included in audits of administrative actions in the environmental area. The report is aimed at professionals from the Federal Court of Accounts (TCU-Brazil) and from sub-national courts, as well as from other members of the Latin American and Caribbean Organization of Supreme Audit Institutions (OLACEFS).

The report discusses the main concepts and methodologies associated with environmental accounting, assesses the progress of the issue in the countries of the Latin American and Caribbean (LAC) region, and presents how environmental accounting can be used in the planning, implementation, monitoring, and evaluation of public policies. Case studies of how Environmental Economic Accounts have been developed in practice in Latin America are also presented. This report discusses the uses of the accounts in the context of audits on biodiversity and other environmental and sustainability topics.

Acronyms and abbreviations

MA - Millennium Ecosystem Assessment

ANA - National Water and Sanitation Agency (Brazil)

ANAM - National Environment Authority (Panama)

BEN - National Energy Balance (Brazil)

BIP - Biodiversity Indicators Partnership

BMZ - German Federal Ministry for Economic Cooperation and Development

CBD - Convention on Biological Diversity

GIZ - *Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH*

CNAE - National Classification of Economic Activities (Brazil)

COMTEMA - Special Technical Commission for the Environment of the Latin American and Caribbean Organization of Supreme Audit Institutions

CONAB - National Supply Company

ES - Environmental Statistics

ECLAC - Economic Commission for Latin America and the Caribbean

EFS - Supreme Audit Institutions

EPE - Energy Research Office (Brazil)

ES - Ecosystem services

ESs – Environmental Statistics

EU- European Union

GHG - Greenhouse Gases

GDP - Gross Domestic Product

GOAP - Global Ocean Accounts Partnership

IBGE - Brazilian Institute of Geography and Statistics

ILAC - Latin American and Caribbean Initiative for Sustainable Development

INPE – National Institute for Space Research

INTOSAI - International Organization of Supreme Audit Institutions

IPBES - Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services

ISSAI - International Standards of Supreme Audit Institutions

IUCN - International Union for the Conservation of Nature

LAC – Latin America and the Caribbean

LULUCF - Land Use, Land-Use Change and Forestry

MEA - Multilateral Environmental Agreement

NBSAP - National Biodiversity Strategy and Action Plan

NPV- Net Present Value

NTFM - Non-Timber Forest Products

OECD - Organization for Economic Cooperation and Development

OLACEFS - Latin American and Caribbean Organization of Supreme Audit Institutions

PIBE - Ecological Gross Domestic Product (Mexico)

PINE - Ecologically Adjusted Net Domestic Product (Mexico)

SDG - Sustainable Development Goals

SEEA - System of Environmental Economic Accounting

SEEA-AFF - System of Environmental Economic Accounting (Agriculture, Forestry and Fisheries Subsystem)

SEEA-EA - System of Environmental Economic Accounting - Ecosystem Accounting

SEEA-EEA - System of Environmental Economic Accounting - Experimental Ecosystem Accounting

SEEA-Energy - System of Environmental Economic Accounting (Energy Subsystem)

SEEA-CF - System of Environmental Economic Accounting - Central Framework

SEEA-Water - System of Environmental Economic Accounting (Water Subsystem)

SCEEM - System of Economic and Ecological Accounts of Mexico

SFB – Brazilian Forest Service

SNA - System of National Accounts

TCU - Federal Court of Accounts (TCU-Brazil)

TEEB – The Economics of Ecosystem and Biodiversity

TRU - Tables of Resources and Uses

UN - United Nations

UNCCD - United Nations Convention to Combat Desertification

UNCEEA - United Nations Committee of Experts on Environmental-Economic Accounting

UNEP - United Nations Environment Programme

UNEP-WCMC - United Nations Environment Programme World Conservation Monitoring Center

UNFCCC - United Nations Framework Convention on Climate Change

UNSD - United Nations Statistics Division

UNWTO - UN World Tourism Organization

WAVES (Project) - Wealth Accounting and the Valuation of Ecosystem Services

WGEA - INTOSAI Working Group on Environmental Auditing

Glossary

Ecosystem accounting area - Geographic area for which an Ecosystem Account is compiled. These areas of accounting may be: national jurisdictions, groups of countries, subnational administrative areas, environmentally defined areas within a country or between countries, and other areas of policy or analytical interest.

Environmental assets - Living and non-living components naturally occurring on the planet. Together they constitute the biophysical environment, which can provide benefits to humanity.

Ecosystem assets - Contiguous spatial areas of a specific ecosystem type characterized by a distinct set of biotic and abiotic components and their interactions. Ecosystem assets are considered assets based on their biophysical existence and are not dependent on the establishment of benefit flows or ownership as required for economic assets in the SNA.

Economic assets - A store of value (entities or items) that belongs to institutions, individuals, or collectives and that generates a stream of future economic benefits to its owners over time.

Benefits - Goods and services that are used and enjoyed by people and that contribute to individual and social well-being.

Ecosystem condition - Overall quality of an ecosystem asset measured in terms of its characteristics. It is the condition that maintains ecological integrity and that sustains the ability of an asset to generate ecosystem services. Thus, changes in the ecosystem conditions have an impact on the expected flow of their services.

Input data - Data used to compile the environmental economic accounts (EEA)

Ecosystem - Dynamic complex of plant, animal and microorganism communities and their inorganic environment, interacting as a functional unit, as provided in Art. 2 of the Convention on Biological Diversity - CBD. Ecosystems can be identified at different scales; for accounting purposes, ecosystem assets are defined by delineating single, contiguous spatial areas.

Spatial scales - The extent (or area) of interest (e.g., a country, watershed, national park) and the size of the basic spatial units within this area used to organize data for accounting (for example, 1 ha. grid cell).

Aggregated statistics - Indicators for related categories that can be grouped or aggregated in order to provide a more comprehensive or summary perspective. Basically, they are totals obtained for the accounts. For example, total value of ecosystem services supplied and used.

Multipurpose statistical framework - An information system that provides statistics and indicators consistently and that is consistent with other statistics, such as the system of national accounts (SNA). Multipurpose implies that the structure was not designed for any specific purpose, but to support different users in their analysis and planning for different environmental, economic and social issues.

Ecosystem extent - Size of an ecosystem asset in terms of spatial area, sometimes counted in terms of the ecosystem types.

Indicators - A measure related to a key problem or phenomenon and obtained from the accounts.

Trade-offs, commitments or choice dilemmas - A trade-off is a situation in which an improvement in the status of one aspect of the environment or human well-being is necessarily associated with a decline or loss of a different aspect. Trade-offs characterize most complex systems and must be considered when making decisions that aim to improve environmental and/or socioeconomic results.

Ecosystem services - nature's contributions to people, including to human well-being and economic activities. Therefore, they exclude the set of flows commonly called support or intermediary services that contribute to intra and inter-ecosystem processes. In the Brazilian literature, references are found to the terms ecosystem services or environmental services. They are organized into three categories: provisioning, regulating and cultural.

Exchange value - One in which goods, services, labor or assets are in fact exchanged, or could be exchanged, for money.

Net present value - is used in accounting to calculate the value at the present date (zero) of future values (costs and revenues) using a discount rate.

[Sources: Glossary IBGE, available at <https://biblioteca.ibge.gov.br/visualizacao/livros/liv101753.pdf>: IPBES glossary, available at <https://ipbes.net/glossary>: SEEA - global consultation, available at: <https://seea.un.org/content/global-consultation-complete-draft>]

A close-up photograph of a green leaf, showing its intricate vein structure and numerous small, glistening water droplets scattered across its surface. The lighting is soft, highlighting the texture of the leaf. In the lower-left quadrant, the text "1. INTRODUCTION" is overlaid in a bold, white, sans-serif font.

1. INTRODUCTION

Environmental degradation, especially the loss of biodiversity, is one of the greatest challenges facing humanity. The Secretary-General of the United Nations (UN) High-level Panel on Global Sustainability (2012) concluded that the current economic model is “*pushing us inexorably to the limits of natural resources and life support systems on the planet.*” This conclusion is also mentioned in the recent Report on the Economics of Biodiversity (Dasgupta, 2021). To reverse this trajectory, public policy makers, companies, and other actors need to have access to consistent and up-to-date information about the environment and the benefits it provides for the economy and human well-being, so that they can be integrated into decision-making (Hein et al., 2020; Vardon, Keith, et al., 2019). **Environmental Accounting** has been developed to respond directly to these information needs.

1.1. National accounts and environmental accounting

The **System of National Accounts (SNA)** is a structure used and tested to organize information on economic activities and inform national economic policy. However, it has long been recognized that the SNA fails to consider the conversion and degradation of natural resources and the associated economic and welfare implications (Repetto, 1992). This has had consequences in the formulation of public policies, as it leads to the mistaken understanding that nature and the benefits it provides are “free” and can be ignored and/or degraded in the process of achieving economic growth. This assumption results in permanent loss of wealth as ecosystems disappear or deteriorate, compromising nature’s long-term ability to contribute to human well-being and the economy.

The **System of Environmental Economic Accounting (SEEA)** aims to address this SNA deficiency, accounting for the environment and linking it to economic information through common concepts, definitions and classifications (Vardon et al., 2018). The SEEA methodological structure was developed in 1993 in response to the demands of policy makers (Burnett et al., 2020). The integrated information set enables evidence-based decision making about trade-offs and synergies between the economy and the environment, as well as assessing trends over time and associated management options (Keith et al., 2017). The following figure shows the four main reasons for the importance of the SEEA (Figure 1).¹

1.2. Methodology of environmental economic accounts

SEEA was designed to be consistent and integrable with the SNA. As such, it was designed as part of the national accounting system. It consists of two parts, the **Central Framework (SEEA-CF)**, adopted as an international statistical standard in 2012, and the **Experimental Ecosystem Accounting (SEEA-EEA)**, first published in 2014 (Hein et al., 2020). Technical recommendations to support the implementation of SEEA-EEA were first published in 2017 (UN et al., 2017). The United Nations Statistics Commission recently approved the System of Environmental Economic Accounting Ecosystem Accounting (SEEA-EA) in its 52nd session on March 5, 2021 (UN Statistical Commission, 2021). Throughout this report, and whenever case studies are presented, they refer to the SEEA-EEA since, at the date of its preparation, the statistical standard was not yet available.

¹Adapted from: https://seea.un.org/sites/seea.un.org/files/enhanca_factsheet_overview.pdf

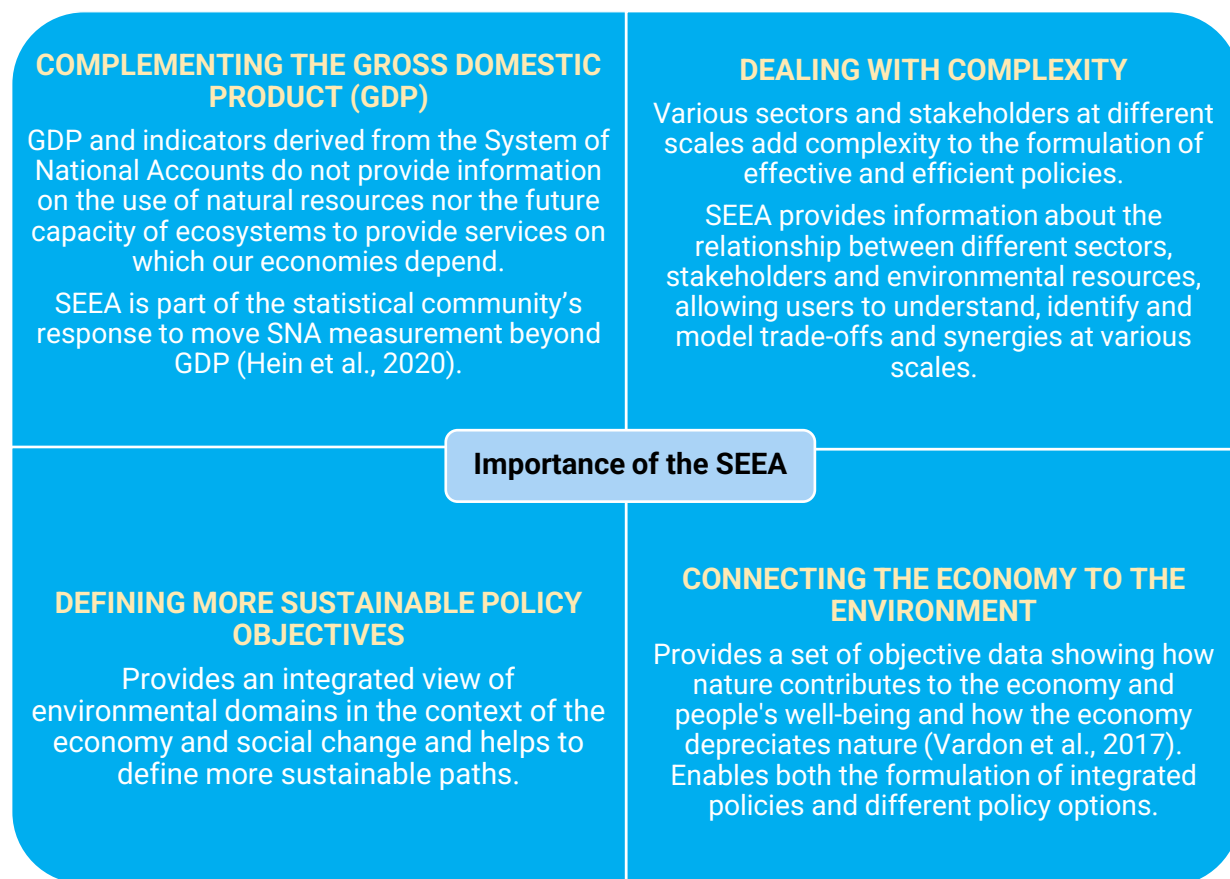


Figure 1 - Importance of the SEEA (own elaboration)

SEEA-CF was conceived as a multipurpose statistical structure and comprises several “*accounting modules*” to describe the interactions between the economy and the environment. This includes **stocks** of **environmental assets** (e.g., fish stocks) and the **flows** of products and services they provide (e.g., quantity in tonnes of fish entering the economy); the inputs that environmental assets receive (e.g., emissions from agriculture, industry and power plants to the atmosphere and waters); and expenditures on environmental protection and resource management (UN et al., 2014).

Thematic subsystems for SEEA-CF were developed for water (SEEA-water), energy (SEEA-energy), agriculture, forestry and fishing (SEEA-AFF), and a classification of environmental activities (CEA).

The SEEA-EA extends the system of national accounts to consider ecosystems and biodiversity as assets (UNSD, 2021). The SEEA-EA accounting model proposes that changes in the stock of ecosystem assets be measured through changes in the biophysical measures of the extent of different ecosystem types and their condition over an accounting period (usually one year). Ecosystem assets also produce a flow of ecosystem services over time, which contributes to the production of economic and human well-being.

The SEEA-EA is composed of five main accounts. These accounts are compiled using spatially explicit data and information about the extent, condition and value of ecosystems and the flows of ecosystem services they provide. The five accounts mentioned (also illustrated in Figure 2) are:

1. Ecosystem Extent Accounts (Physical): they record the total area of ecosystem assets, classified by type of ecosystem, in a specific area (ecosystem accounting area). These accounts record the initial and final extent of different types of ecosystems over an accounting period (for example, one year) in the ecosystem accounting area (for example, a country, province, watershed, protected area, etc.). They show changes in the extent from one ecosystem type to another over the accounting period.

2. Ecosystem Asset Condition Accounts (Physical): they record the condition of ecosystem assets with respect to the characteristics selected over accounting periods. These accounts record changes in the condition of ecosystems over time, providing information on the ecological integrity of ecosystems and their capacity to supply ecosystem services.

3 and 4. Ecosystem Services Flow Accounts (Physical and Monetary): they record the supply of ecosystem services by ecosystem assets and the use of these services by economic units, including households. The registration of these transactions in services between ecosystems and the different units of the economy (households, businesses, government) makes it possible to integrate ecosystem accounting into the SNA's economic accounting (Eigenraam and Obst, 2018).

5. Ecosystem (Stock and Flow) Asset (Monetary) Accounts: they record information on stocks and changes in those stocks (additions and reductions) of ecosystem assets in monetary terms. This includes accounting for degradation of ecosystems and their improvement (e.g., via ecosystem restoration). They assign a value to ecosystem assets based on the monetary value of future ESs

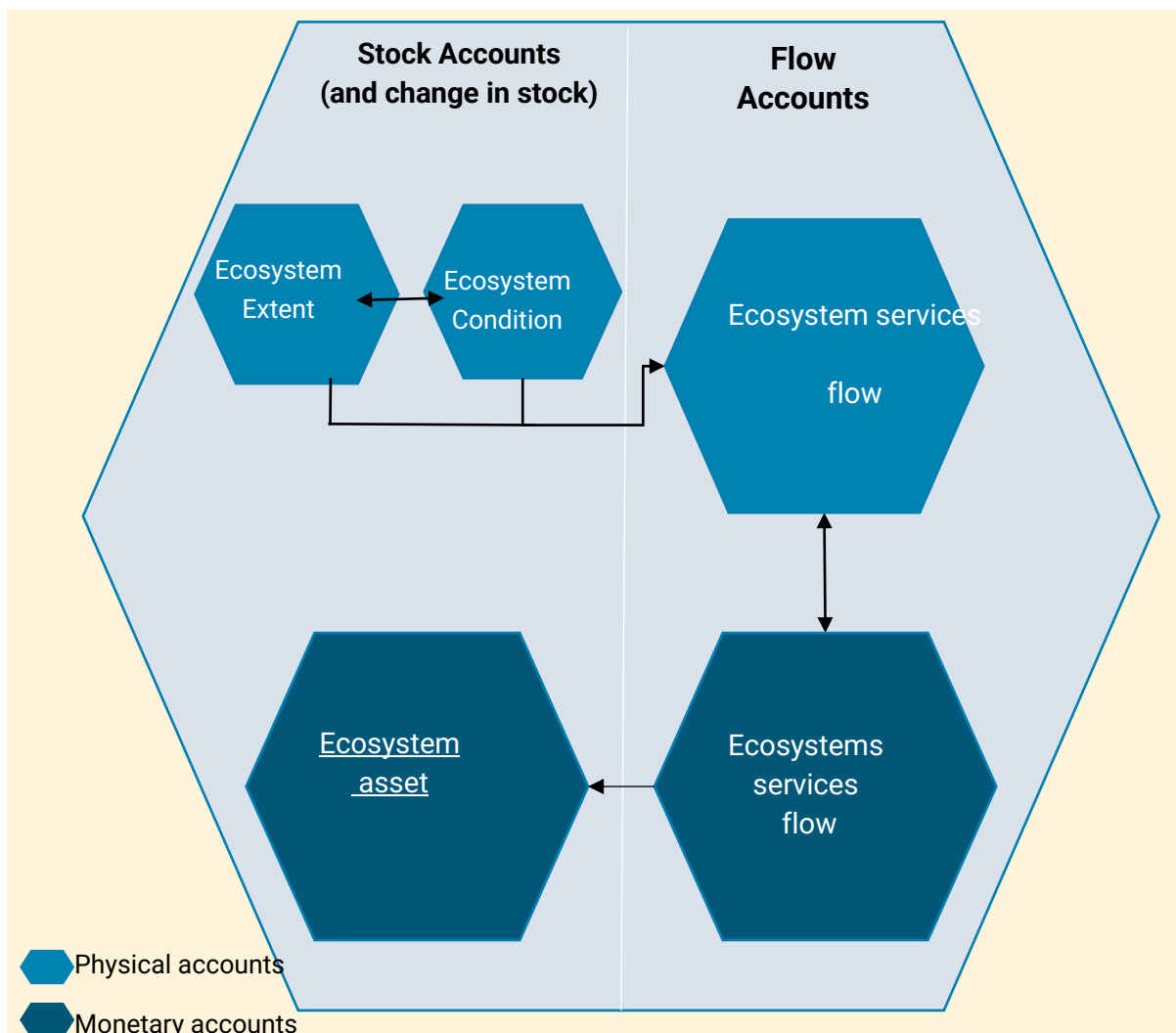


Figure 2 - SEEA-EA Accounting Modules (UNSD, 2021)

The main physical and monetary accounts in Figure 2 are designed to provide a comprehensive and systematic framework for ecosystems and their relationship to the economy. It is important to note that

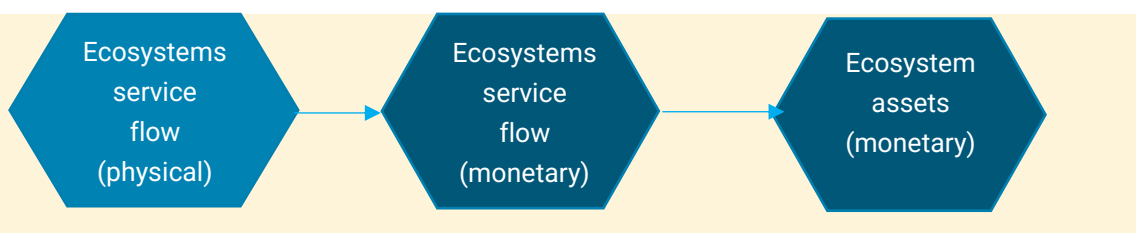
the SEEA-EA chapters related to the compilation of the physical accounts of ecosystem extent, ecosystem condition and ecosystem services were adopted as an international statistical standard in March 2021.

The **Ecosystem services** and **ecosystems asset** monetary accounts assign monetary values that reflect the concept of an “exchange value” required by the SNA. At the date of this report, the chapters on the compilation of the Monetary Ecosystem Services Accounts and the Monetary Ecosystem Asset Accounts remain internationally recognized and recommended statistical principles.. Further details on the relationship between physical accounts and monetary accounts for ecosystem services can be found in Box 1. [BOX 1- Relationships between SEEA-EEA Monetary Accounts]

The SEEA-EA framework recognizes that policy and analysis can also focus on specific environmental issues (UNCEEA, 2020). This includes thematic accounting for biodiversity, climate change, oceans and urban areas. Thematic accounting for each of these types of accounts was explored in session 4 of the Virtual Expert Forum on SEEA Ecosystem Accounting.² Accounting for the Ocean theme has advanced through the Global Ocean Accounts Partnership (GOAP).³ Other important thematic accounts are the accounting for Protected Areas, Mangroves and Forests.

BOX 1- Relationships between SEEA-EEA Monetary Accounts

In the SEEA-EA, ecosystem services are described as the contributions of ecosystems to the benefits used in the economy and other human activities. The sequence of accounts related to ecosystem services is described in the following image:



The **physical ecosystem services account** records the supply of final ecosystem services by ecosystem assets and the use of those same services by economic units, including households, businesses and governments, in physical terms (for example, tons of fish) over an accounting period (for example, one year). The accounts record the transaction between ecosystem assets and the economic user of ecosystem services.

The **monetary ecosystem services account** records these flows in monetary terms. Typically, these monetary estimates are based on the price multiplied by the physical quantity. This reflects the use of “exchange values” in ecosystem accounting, which are the values for which goods and services are exchanged (or can be exchanged) for a monetary value. Here it is important to note that exchange values may not reflect the total economic value of ecosystem services often used in cost-benefit analyses or in the analysis of environmental policies.

The **monetary ecosystem assets account** records the monetary value of ecosystem assets based on the monetary valuation of future ecosystem services and applying a net present value⁴ (NPV) approach. Basically, a discount rate is applied to the flows of ecosystem services in future years and adding them up. Using this approach, monetary values for ecosystem assets are recorded at the

²<https://seea.un.org/events/virtual-expert-forum-seea-experimental-ecosystem-accounting-2020>

³<https://www.oceanaccounts.org/>

⁴The net present value (NPV) is the value of an asset determined by estimating the revenue stream that is expected to be earned in the future and then applying a discount rate to calculate the appropriate amount for the current accounting period.

beginning and end of each accounting period. As the condition of ecosystems improves or degrades, the value of the asset changes according to changes in the supply and use of associated ecosystem services.

One of the main advantages in calculating the monetary value of the ecosystem assets and ecosystem services is the fact that it allows an integrated analysis with other economic statistics, such as the balance sheets of national wealth and the allocation of improvement and degradation to different economic units.

Extent accounts are relevant for assessing changes in the extent and location of different ecosystems in terms of land use, management and ownership. **Condition** accounts show the damage caused by human activity and the results, for example, of restoration efforts. **Ecosystem services accounts** allow to assess which services are being lost/degraded, how these ESs contribute to the economy and which parts of the population are being affected (Figure 3).⁵

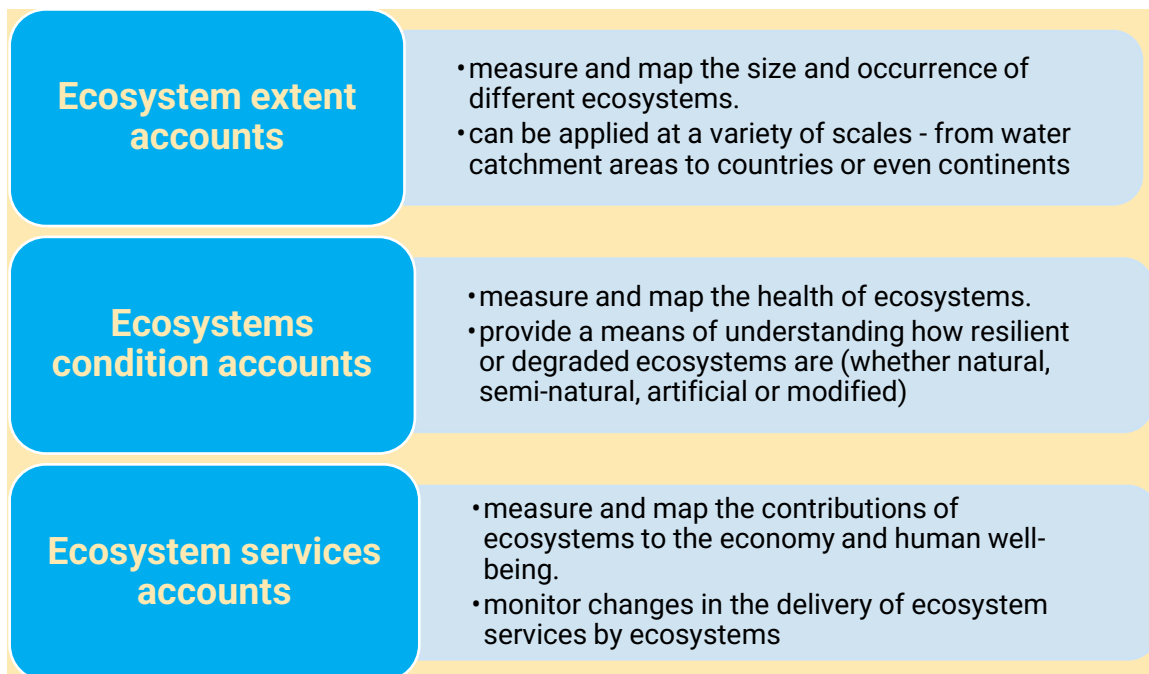


Figure 3 - Description of ecosystem accounts

To learn more about the SEEA methodology ...

More information on the methodological aspects of the SEEA and its different thematic areas can be found on the SEEA website maintained by the United Nations Statistics Division (UNSD) (<https://seea.un.org/>). There is also a page specifically on the review process of the system of experimental ecosystem accounting (SEEA-EEA) (<https://seea.un.org/content/seea-experimental-ecosystem-accounting-revision>) and a page for the system of ecosystem accounting (SEEA-EA) (<https://seea.un.org/ecosystem-accounting>). For the recently approved international statistical standard for ecosystem accounting (SEEA-EA), in March 2021, UNSD also provided an article and a video: <https://news.un.org/en/story/2021/03/1086102>

⁵Adapted from:

UNSD also established an introductory e-learning course for SEEA-CF and SEEA-EEA, completely online and available in English and Spanish versions. These and other sources of information can be found in Appendix 1 (Recommended reading) and Appendix 2 (Websites).

1.3. Contributions of the accounts in the planning, monitoring and evaluation of public policies

The SEEA provides a framework for consistently organizing and integrating information about the environment, the economy and society. The coherence of the SEEA with broader statistics also makes it a valuable tool to **inform policies related to the relationship between the environment and the economy** (UN et al., 2014). The aggregate indicators and statistics that can be obtained from different accounting modules can inform all stages of public policy development, implementation and monitoring, from problem/agenda identification and policy making to monitoring and reviewing the implementation of those same policies (Bass et al., 2017). Bringing the production of these indicators into national accounting also substantially expands the prospects for long-term policy planning.

The use of the SEEA to inform and refine public policy and decision-making has been explored across a range of policy issues through a series of global policy forums convened by the World Bank.⁶ These have illustrated the broad potential of the SEEA to improve policy on environmental resources, such as forests, land use, energy, ecosystems, biodiversity and water. By integrating information about the environment and the economy, the SEEA can also promote a **cross-sector approach** to managing the use of environmental resources, explicitly considering the associated trade-offs and synergies.

1.4. Accounts contributions to the biodiversity agenda, the 2030 agenda and other global sustainable development agendas

The SEEA can support the generation of **indicators** for many **international agreements**, such as the indicators of the 2030 Agenda's Sustainable Development Goals (SDGs), the Aichi biodiversity targets of the Convention on Biological Diversity (CBD), the objectives of the United Nations Convention to Combat Desertification (UNCCD), the goals of the United Nations Framework Convention on Climate Change (UNFCCC), the Intergovernmental Science-Policy Platform for Biodiversity and Ecosystem Services (IPBES), the Biodiversity Indicators Partnership (BIP) and the Ramsar Report (UNCEEA, 2018)

The role of the SEEA in supporting **Agenda 2030** and the Aichi biodiversity targets of the Convention on Biological Diversity (CBD) was assessed by the UNSD (2019). This report identified the potential of experimental ecosystem accounting and selected environmental economic accounts to support the integration or calculation of 34 of the 147 Aichi biodiversity target indicators and 21 of the 230 SDG target indicators. Some of the SDG Target indicators that the SEEA-EEA can support the calculation of include: SDG Indicator 15.1.1 - Forest area proportion; SDG indicator 6.6.1 - Change in the extent of water-related ecosystems; and, SDG Indicator 15.3.1 - Degraded land proportion (UNEP-WCMC & UNSD, 2019). In addition, the United Nations Committee of Experts on Environmental-Economic Accounting (UNCEEA) identified 40 priority indicators across nine SDGs that the SEEA can provide input or

⁶<https://www.wavespartnership.org/en/policy-forum-natural-capital-accounting-better-decision-making>

complementary data for. In fact, the SEEA provides data for more than half of the SDG targets. Therefore, the implementation of the SEEA has been driven by the 2030 Agenda (UNCEEA, 2018).

The SEEA can also support the **Post-2020 Biodiversity Framework** with regard to measuring the extent, condition and services of ecosystems, while helping to defend and conserve biodiversity, providing a full picture of its connection to the economy. There is also an important role for the SEEA in deriving key indicators for countries, notably in the context of National Biodiversity Strategies and Action Plans (NBSAP) to achieve the CBD's targets and commitments (Vardon, Bass, et al., 2019).

The usefulness of the SEEA as a tool to integrate the environment and biodiversity into **national planning** processes is recognized through SDG Indicator 15.9.1⁷ and Aichi Biodiversity target 2.⁸ This reflects that, for the "universal, integrated and transforming" Sustainable Development Goals (SDGs) to be achieved, country's development structures need to be much more integrated and well informed by elements of the relationship between the environment and the economy (provided by environmental accounting)(Vardon et al., 2017). In this context, the SEEA provides a key evidence base to **support integrated policies** based on a better understanding of the interactions and trade-offs between the environment and the economy.

Ruijs et al., (2018) reviewed the role of the SEEA in supporting the integrated analysis of sustainable development policies, for example, in supporting projections, scenario analyses, integrated assessments and expanded analyses of environmental inputs and products. It was noted that, in cases where the SEEA is well developed, accounts can significantly reduce the data collection burden for prospective analysis in order to inform policy planning. The SEEA's role in informing progress towards the SDGs was highlighted through a series of policy applications at the World Bank's 2nd WAVES Policy Forum (Ruijs & Vardon, 2018). The ability of the SEEA to integrate environmental, social and economic information in a structured approach makes it an essential tool for recognizing the benefits that biodiversity offers and managing its loss by integrating biodiversity into national planning (Burnett et al., 2020; King et al., 2021).

⁷SDG Indicator 15.9.1 - Progress on national targets set according to Aichi biodiversity target 2 in the Strategic Plan for Biodiversity 2011-2020.

⁸Target 2: By 2020, at the latest, biodiversity values must be integrated into development and poverty reduction strategies, national and local planning processes, and be incorporated into national accounting, in an appropriate manner, and systems of documentation and communication.



2. ENVIRONMENTAL ACCOUNTING IN LAC

2.1. Accounts overview

Environmental Accounting in Latin America and the Caribbean (LAC) is of great relevance given that the region is home to the greatest biological diversity on the planet and several megadiverse countries (Carvajal, 2017). LAC countries have demonstrated, in recent years, a **growing interest** in the development of environmental accounting to analyze their development strategies and decision-making (ECLAC & WAVES, 2017). In 2002, at the “First Extraordinary Session of the Forum of Ministers of Environment of LAC,” the **Latin American and Caribbean Initiative for Sustainable Development (ILAC)** was established and approved. In recent years, the ILAC has played an important role in capacity building, in the generation of environmental indicators and statistics, and in developing the application of the SEEA in the region (Baldivieso et al., 2017). The following figure (Figure 4) shows the evolution of the production of environmental statistics (ESs) in the LAC region, assessed by ECLAC.⁹ However, despite the progress made, some countries have not yet started to produce environmental statistics or their production is not sufficient to calculate SEEA accounts and other indicators.

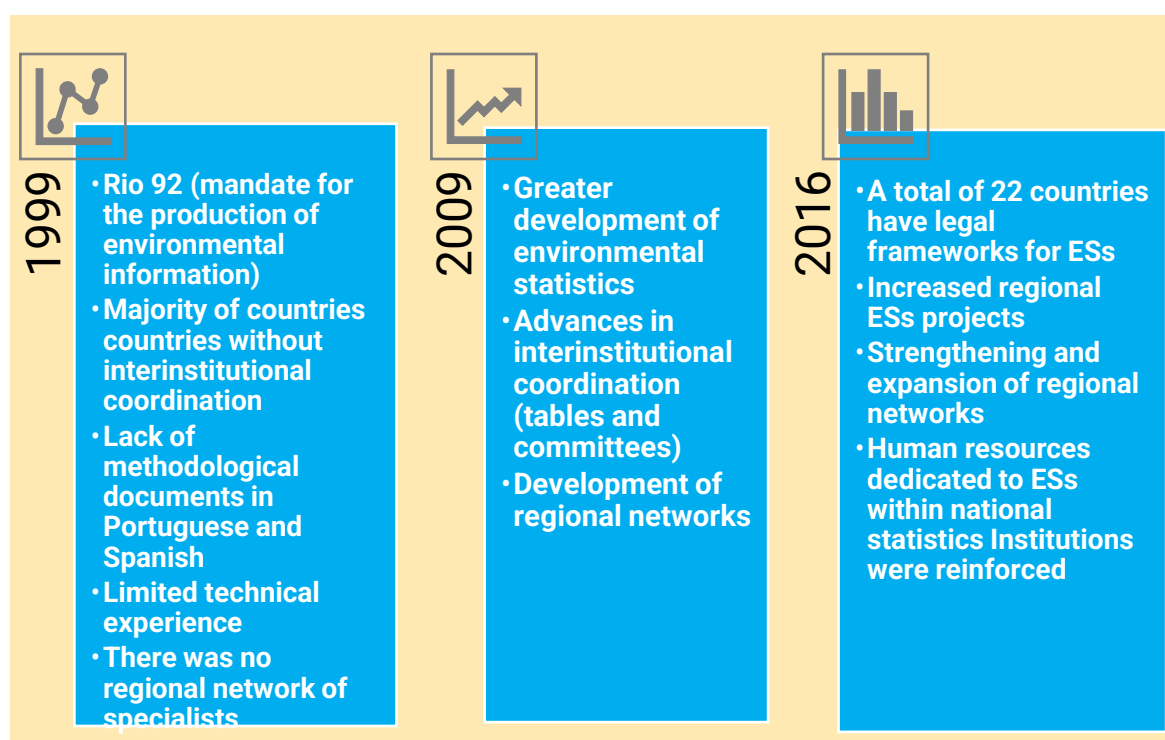


Figure 4 - Progress and status of environmental statistics (to calculate EEA) in LAC countries

The following table presents the **countries** of the region and the **distinct advances in the production of their environmental economic accounts** according to the latest global assessment by UNSD complemented with information collected by ECLAC with the support of the WAVES project (Baldivieso et al., 2017; Carvajal, 2017; ECLAC & WAVES, 2017; UNSD, 2018a). Mexico stands out among the countries, with great advances in the development of SEEA accounts. Mexico has calculated its “Ecological Gross Domestic Product - PIBE” from SEEA information generated in the country since the 1990s and more recently the “Ecologically Adjusted Net Domestic Product” (PINE), which estimates the costs of resource depletion and environmental degradation. Other prominent countries are Costa Rica,

⁹<https://www.cepal.org/es/temas/estadisticas-ambientales/indicadores-ambientales-objetivo-desarrollo-sostenible-ods>

which, in 2016, produced a set of SEEA accounts for the national territory, as well as Brazil, Colombia, Chile, Ecuador, Guatemala, Paraguay, Uruguay and Peru.

Table 1- Status and progress of implementation of the System of Environmental Economic Accounts (SEEA) in LAC according to the latest global assessment made by UNSD complemented with information collected by ECLAC with the support of the WAVES project (Baldvieso et al., 2017; Carvajal, 2017; ECLAC & WAVES, 2017; UNSD, 2018a)

Countries with SEEA development processes (SEEA officially implemented, partially or pilot experiments)	Countries interested in implementing the SEEA	Countries with no SEEA accounts
<ul style="list-style-type: none"> • Argentina • Bolivia • Brazil* • Chile • Colombia • Costa Rica* • Ecuador* • Guatemala* • Guyana • Honduras • Jamaica • Mexico • Panama • Paraguay • Peru • Dominican Republic • Santa Lucia • Uruguay • Venezuela 	<ul style="list-style-type: none"> • Bahamas • Barbados • Dominica 	<ul style="list-style-type: none"> • Aruba • Belize • Bermuda • Cuba • Curacao • El Salvador • French Guiana • Grenada • Haiti • Nicaragua • Saint Vincent and the Grenadines • Suriname • Trinidad and Tobago

* Countries with a high level of institutionalization of their environmental accounting programs

Regarding the **governance and cooperation** institutions for the implementation of the SEEA, LAC countries are characterized by having different forms of organization. In some countries, **National Statistics Institutes or Offices** and/or **Central Banks** are the institutions responsible for compiling SEEA accounts. This is the case in Brazil, for example, where the Brazilian Institute of Geography and Statistics (IBGE) is responsible for coordinating the Committee on Environmental Economic Accounts for Water¹⁰ and leading the process of preparing these accounts. IBGE is also leading the production of other SEEA accounts such as forest, energy, ecosystems and biodiversity, together with the task of producing national accounts. In other countries, **it is the sectoral ministries** that are responsible for compiling SEEA accounts for different themes, while the National Statistics Institutes and/or Central Banks are responsible for producing the national accounts. This is the situation in Panama, for example, where the National Environment Authority (ANAM), through its Environmental Economics Unit, is the institution responsible for calculating the national environmental account¹¹ and liaising with other institutions to acquire the necessary environmental information. Table 2 presents the information on the governance of the SEEA implementation process for the LAC countries (see number in brackets after the country).

¹⁰ <http://www.ibama.gov.br/component/legislacao/?view=legislacao&legislacao=127308>

¹¹ <https://docs.panama.justia.com/federales/leyes/41-de-1998-jul-3-1998.pdf>

The implementation of **SEEA** using the **Central Framework** (SEEA-CF) has been implemented in LAC for various environmental assets such as water, energy, land, minerals and aquatic resources. Table 2 also presents the accounts produced in each of the countries (ECLAC & WAVES, 2017; Quiroga, 2018; Vardon, Bass, et al., 2019) [see **BOX 2 - example of the application of SEEA-CF for water accounts in Brazil**]

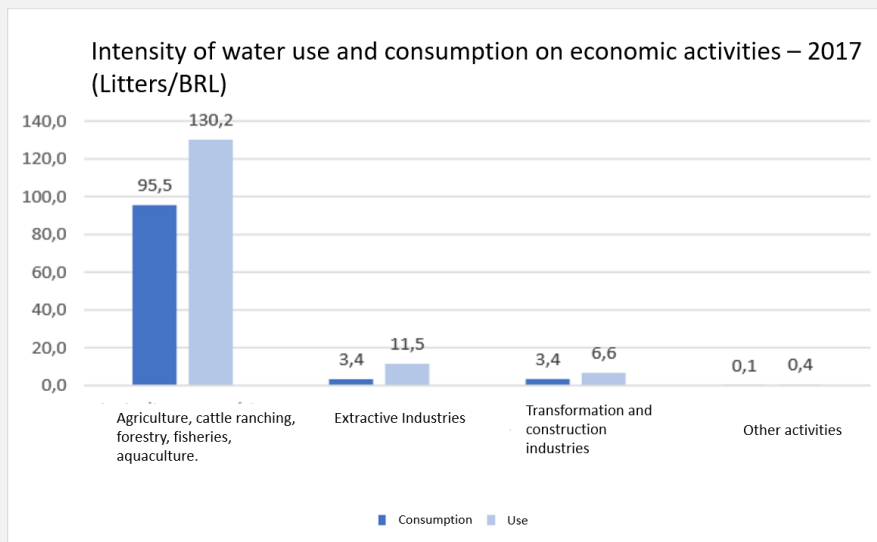
Table 2 - Accounts developed/under development in LAC using the SEEA CF (November 2018)(ECLAC & WAVES, 2017; Quiroga, 2018; Vardon, Bass, et al., 2019) .

SEEA using the Central Framework (SEEA-CF)										
Countries	Minerals and energy		Forest		Earth	Water resources	Aquatic resources	Energy	Emissions	Solid Waste
	Hydrocarbons	Minerals	Timber	NTPP	Usage and Coverage					
Bolivia (1)										
Brazil (1)										
Chile (3)										
Colombia (1)										
Costa Rica (2)										
Ecuador (3)										
Guatemala (3)										
Jamaica (1)										
Mexico (1)										
Panama (4)										
Paraguay (3)										
Peru (4)										
Dominican (3)										
Santa Lucia										
Uruguay (3)										

SEEA Producers: (1) National Statistics Institute (2) Central Bank (3) Central Bank + Ministries + others (4) National Statistics Institute + Ministries + others

BOX 2 - Application of SEEA-CF for water accounts in Brazil (IBGE, 2020)

In 2020, Brazil released the first results of the Environmental Economic Accounts for Water (SEEA Water) for the period 2013 to 2017. These accounts show the **water stocks** (Asset Accounts), the participation of economic activities and households in the **flows** of this resource through withdrawals of water (Physical Supply and Use Tables - PSUTs) and returns to the environment (Emissions Accounts) and under what conditions, in terms of **costs** for users, there is a **use** for water resources (Hybrid Supply and Use Tables - HSUTs: derived from the physical SUTs and monetary SUTs of the SNA). Brazil's SEEA for Water shows that in 2017, for every BRL 1.00 (Brazilian Real) of wealth produced in the country, 6.3 liters of water were used. Over time, we will be able to know if this is increasing or decreasing at the national level and we will know if the country is being more efficient or not in using water to generate wealth.



Intensity of water consumption and use for the generation of one Brazilian Real of Value Added (2017)¹²

(Source: https://biblioteca.ibge.gov.br/visualizacao/livros/liv101710_apresentacao_IBGE.pdf)

The graph shows us that, in 2017, the agriculture, forestry, fishing and aquaculture sector used the most water to produce the same amount of wealth for the country in comparison to the other sectors of the economy. It is also possible to compare the efficiency in the use/consumption of water for each of the economic activities over time. From 2013 to 2017 the agriculture, forestry, fishing and aquaculture sector used less water to produce the same amount of wealth (from around 105 liters/R\$ in 2013 to 95.5 liters/R\$ in 2017). These accounts also brought together results for the 5 largest regions of the country, for the first time. In 2017, for example, focusing on the agriculture, forestry, fishing and aquaculture sector, and considering only consumptive uses, the largest volume of total water withdrawal was in the Midwest Region with around 30%, followed by the Southeast (26%), South (25%), Northeast (12%) and North (7%).

¹² Water consumption is the portion of water withdrawn for use that is not distributed for other economic activities and/or does not return to the environment (for water resources, seas and oceans), because during use it was incorporated into products, or consumed by families or livestock. More details here: https://biblioteca.ibge.gov.br/visualizacao/livros/liv101555_notas_tecnicas.pdf

Only a small number of countries in the region have advanced with the calculation of the **SEEA Experimental Ecosystem Accounting** (SEEA-EEA) accounts, supported by various initiatives (see Annex 3). This is the case of Colombia, Guatemala, Costa Rica, Brazil and Peru¹³ and some pilot experiences in Uruguay. The following table (Table 3) shows the SEEA EEA accounts produced by each of these countries. **[see BOX 3 - example of the application of SEEA-EEA for biodiversity accounts in Mexico]**

Table 3 - Accounts developed or under development in LAC using the SEEA Experimental Ecosystem Accounting (SEEA-EEA) structure

Country	Experimental ecosystem accounts
Colombia	<ul style="list-style-type: none"> • National ecosystems account • Chinchiná River Basin account • Case study: ecosystem accounts for Orinoquía • Update of the national ecosystems account for Orinoquía • Experimental ecosystem account
Guatemala	<ul style="list-style-type: none"> • Ecosystem extent account • Ecosystem condition account, using 9 indicators focused on forests and protected areas. • Provision of ecosystem services in physical terms (in protected areas). • Provision of ecosystem services in monetary terms.
Costa Rica	<ul style="list-style-type: none"> • Experimental ecosystem accounting associated with nature-based tourism, agricultural production and carbon sequestration
Brazil	<ul style="list-style-type: none"> • Ecosystem extent account (2000-2018) published in 2020 • Endangered species account (2014) published in 2020 • Water body condition account • Provision account for non-timber forest products (NTFP) • Water supply account • Water regulation and erosion account • Pilot account for the Rio Grande Basin in the states of Maranhão-Tocantins-PiauÍ-Bahía, focusing on soil, water and carbon services.
Peru	<p>Accounts for the San Martin region (Department of San Martin, Callao province, Peru)</p> <ul style="list-style-type: none"> • Ecosystem extent account • Ecosystem asset account • Ecosystem condition account • Biodiversity Account • Carbon Account • ES usage and supply account (timber, firewood), game meat, ecotourism, water supply, avoided sedimentation) • Water and ecosystems account
Mexico	<ul style="list-style-type: none"> • Previous pilot accounts for the state of Aguascalientes (5,617 km²) • National land and Ecosystem extent accounts • National ecosystems condition accounts

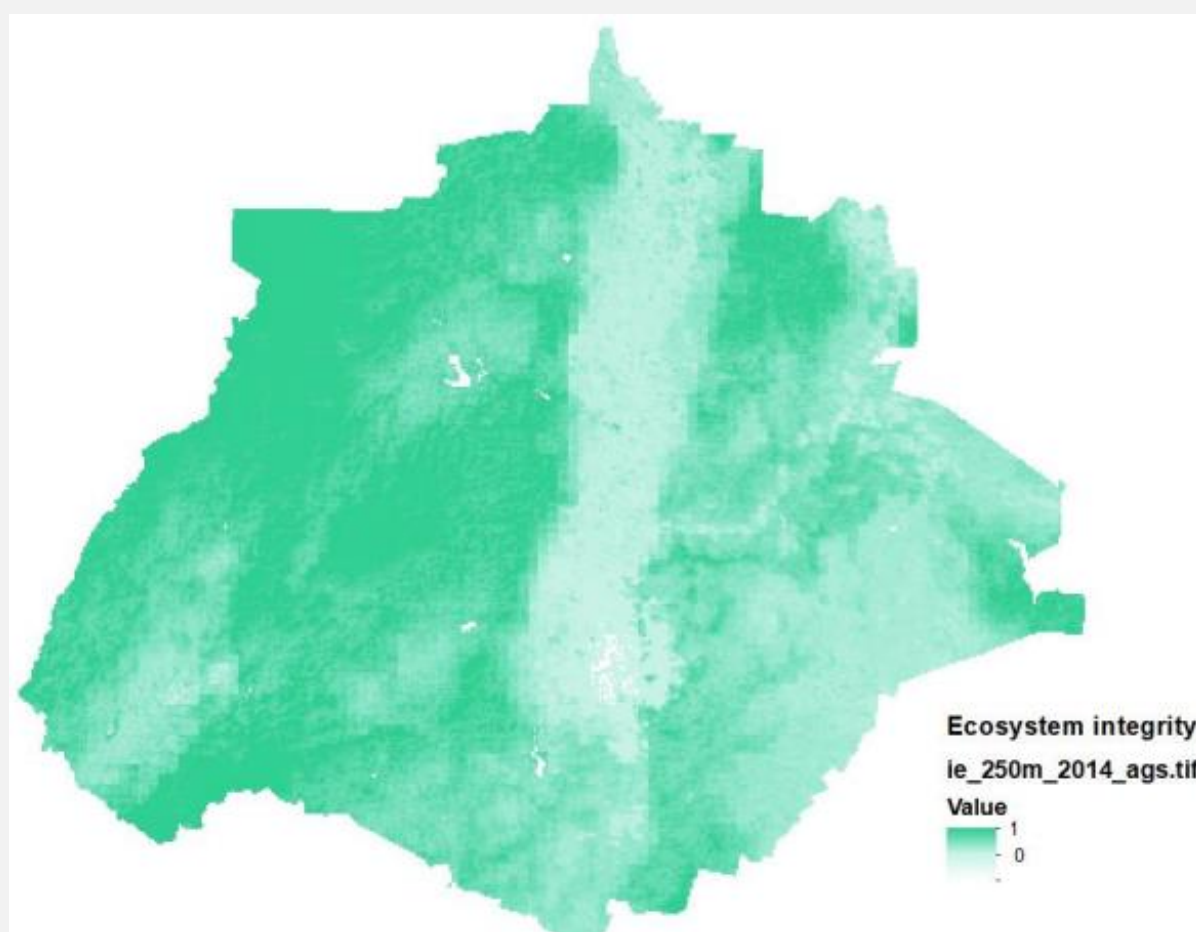
¹³<https://drive.google.com/file/d/1J81AC6fh7lkdHiV5xpB3gluXn8PYA24Q/view?usp=sharing> at <https://seea.un.org/events/london-group-environmental-accounting-26th-meeting>

Country	Experimental ecosystem accounts
	<ul style="list-style-type: none"> • Biodiversity account (uses the ecological integrity index, generated by CONABIO, showing the importance of biodiversity, as well as the consequences of its decline) • Ecosystem services' flow account: carbon storage and sequestration, water production, coastal protection and food supply service
Chile	<ul style="list-style-type: none"> • Ecosystem Pilot Account
Uruguay	<ul style="list-style-type: none"> • Environmental-agricultural account • Santa Lucía River Basin Account • Water Quality Account (Santa Lucía River)

(*) supported by the WAVES Project (**) supported by the ANCA Project (***) supported by the NCAVES Project (****) supported by other projects [more information about these initiatives in Annex 3]

BOX 3– Application of SEEA-EEA to Mexico’s ecosystem accounts (UNCEEA, 2018)

In the context of LAC, Mexico is a leader in natural capital accounting and was the first country in the region to produce its environmental economic accounts (which has been the case since 1994 by the National Institute of Statistics and Geography of Mexico - INEGI). With the support of the NCAVES project (see Annex 2), Mexico is producing ecosystem accounts (extent, condition and ecosystem services), in order to obtain a comprehensive picture of the contributions of its ecosystems to the functioning of the country’s economy. Extent accounts will have an additional focus on protected areas and Ramsar Sites. The condition accounts (concerning vegetation conservation status, soil erosion, alien invasive plant species, soil organic carbon and the ecological integrity index) will serve as a basis for the construction of indicators on ecosystem resilience and health by the National Commission for the Knowledge and Use of Biodiversity (CONABIO). Mexico’s Ecosystem Services Supply and Use accounts will assess the contribution of the main ecosystem services to the economy, including carbon sequestration, water production and food supply services.



Map of the Ecosystem Integrity Index of the state of Aguascalientes (CONABIO)

(Source: https://seea.un.org/sites/seea.un.org/files/documents/Forum_2018/s13_mexico.pdf)

Ecosystem integrity index:

An index representing the structural integrity of ecosystems, based on 39 variables that are assessed against expected values under relatively intact conditions and the ratings are aggregated into a single score ranging from 0 to 1)

2.2. Contributions of Environmental Accounts to public policies in the region

Environmental accounting can provide consistent and regular statistics on the state and trends in natural resources to assess the progress of policy goals and objectives. The SEEA also allows statistics to be obtained on the value of natural resources and the benefits they provide. This can assist in assessing the costs and benefits associated with different public investments in the management and protection of natural resources.

The relevance of these accounts becomes even greater for biodiverse countries and/or those possessing a significant natural and environmental heritage, as are a large portion of the countries of the LAC region. In this sense, the SEEA has the potential to facilitate decisions on macro-policies of economic development, based on scientific knowledge, and that require data to inform long-term growth and prosperity (GIZ, 2019d). The following figure (Figure 5) shows some examples of how SEEA accounts are being used in the context of planning and follow up of public policies in the region. (ECLAC & WAVES, 2017; Vardon, Bass, et al., 2019). **[see also BOX 4 - Participatory process for assessing the contribution of the EEAs to public policies in Brazil].**

Forest Accounts (timber)

Colombia: have served as a basis for analyzing the costs of forest fires caused by the El Niño Phenomenon; used in regulation of the Compensatory Rate for Timber Harvesting in Natural Forests

Costa Rica: assist in monitoring the National Forest Development Plan and has supported the assessment of the REDD + strategy

Energy accounts

Costa Rica: provide information to monitor patterns of energy use and productivity needed to achieve the National Energy Plan's goal of reducing dependence on fossil fuels.

Guatemala: were fundamental for opening the dialogue to inclusion to the the control of carbon emissions in climate change policies and development strategies

All Accounts

Mexico: used for the country's environmental landscape, as part of the Environmental and Natural Resources Program. SEEA accounts are also used to estimate the country's PIBE.

Colombia: used to monitor climate change mitigation policies, policies related to monitoring of water stocks and natural capital, and green jobs. Their indicators are used for the SDGs, Colombia's Green Growth Policy and Comprehensive Solid Waste Policy.

Water Accounts

Brazil: used for the construction, by the National Water Agency (ANA), of indicators to assess the scope of SDG 6.

Costa Rica: applied by the Central Bank of the country in the water supply sector in order to show the usefulness of SEEA information for business. The use and supply of water by the industry for 2005-2013 was assessed with the objective of monitoring sustainability, water tariffs and Payment for Environmental Services

Ecosystem Accounts

Guatemala: used to monitor the impacts of climate change and to adopt policies for the sustainable management of material for firewood.

Mexico: the water condition account provides water quality indicators that are parameters generated by the National Water Commission (CONAGUA), for monitoring the country's water bodies

Land Accounts

Guatemala: provided the necessary elements on the relationship between land use, coverage and agricultural production for the construction of the "Comprehensive Rural Development Initiative Law"

Figure 5 - Some uses of EEAs for public policies in LAC countries.

BOX 4 - Participatory process for assessing the contribution of the SEEA to public policies in Brazil (UNCEEA, 2018)

For **Brazil**, in the context of the Regional-Local TEEB Brazil-Germany bilateral cooperation project, a process of discussion was held throughout 2018 on the contribution of water, forest and energy accounts to sectoral public policies involving sectoral ministries and levels of government responsible for strategic planning (Young, 2019). This work gave rise to three publications (GIZ, 2019a, 2019b, 2019c).

Prioritized policies to be improved with inputs from water accounts:

- National Water Resources Plan (PNRH);
- Pluriannual Plan (PPA) 2016-2019
- Agenda 2030, focusing on SDG 6 - Clean Water and Sanitation, which refers to the sustainable management of water resources.

Prioritized policies to be improved with inputs from energy accounts:

- National Energy Plan (PNE 2050)
- Ten-Year Energy Plan (PDE)
- National Energy Efficiency Plan (PNEf)
- Pluriannual Plan (PPA)
- Transport sector policies
- Environmental policies such as: the National Climate Change Plan (PNMC); the Nationally Determined Contributions (NDC), which are part of the Paris Agreement; the Inventory of Greenhouse Gas Emissions, which integrates the commitment assumed under the Kyoto Protocol; the PNRH; and the National Solid Waste Policy (PNRS)

Prioritized policies to be improved with inputs from forest accounts:

- Agricultural regulation and land-use planning policies
- Deforestation monitoring and control policies
- Policies to promote sustainable productive activities



Access to publications [here](#) .

The vital connection between adequate governance and sustainable development has led to the inclusion of SDG 16, commonly referred to as the Governance Goal in the 2030 Agenda (OECD, 2016). Good environmental governance requires an adequate management of the public financial resources that are applied in the sector. Achieving good environmental governance also depends on the existence

of institutions that can formulate and improve public policies. The substantial degradation of the environment observed today is highlighted as an institutional failure towards environmentally sustainable development (Dasgupta., 2021). In order to achieve better environmental outcomes, institutions need access to robust data on the environment and the economy, to assess the performance, efficiency and effectiveness of policies. In this context, the SEEA contributes to the periodic supply of this data on a consistent, comparable basis.

3.1. The role of environmental audits

Supreme Audit Institutions (SAIs) are national institutions whose mission is to promote and foster the efficiency, responsibility, effectiveness and transparency of public administration (UNGA, 2015). The traditional role of SAIs has been to verify government spending and provide oversight for accountability and transparency of such expenditures, but SAIs increasingly go beyond this role. An OECD survey of these institutions highlights that SAIs also play a role in assessing governments' strategic planning processes or in assessing the communication and coordination capacities of the central institutions of those same governments (OECD, 2016). The same survey indicated that SAIs are tracking, formally or informally, issues that help explain deficiencies in the cost-effectiveness of programs and policies, highlighting the role of SAIs in supporting the full policy cycle (OECD, 2016).

The importance of SAIs is recognized by the UN General Assembly through Resolution A/69/228 for *"promoting the efficiency, responsibility, effectiveness and transparency of public administration, leading to the achievement of national development goals and priorities, as well as internationally agreed development goals."* Environmental degradation and loss of biodiversity are key development policy issues where SAIs' activities can improve the formulation, implementation, evaluation and review of policy, governance and management results. The interest among SAIs from different countries in environmental issues goes back to, at least, the Rio Convention and the formation of the Working Group on Environmental Audits (WGEA) of the International Organization of Supreme Audit Institutions (INTOSAI) in 1992.

The WGEA aims to improve the use of the audit mandate and audit instruments in the field of environmental protection policies.¹⁴ In Latin America and the Caribbean, the Latin American and Caribbean Organization of Supreme Audit Institutions (OLACEFS) brings together SAIs from 22 countries. The OLACEFS Special Technical Commission for the Environment (COMTEMA) was created in November 1998 with similar aspirations to develop environmental audits and promote environmental control at the regional level. An important result of COMTEMA was the audit of sustainable development topics, such as Climate Change, Water Resources, Protected Areas/Biodiversity, Environmental Liabilities, SDG 2.4.¹⁵

¹⁴<https://www.environmental-auditing.org/about/background/>

¹⁵<https://www.olacefs.com/environment-comtema/?lang=en>

The Federal Court of Accounts (TCU-Brazil) and the Coordinated Audit on Protected Areas

The Federal Court of Accounts (TCU-Brazil) coordinated the second edition of the Coordinated Audit on Protected Areas between 2018 and 2020, and was responsible for consolidating the audit results, the production of the maps and the final communication products. Based on the INDIMAPA methodology, it assessed the contribution of protected areas to biodiversity conservation and the achievement of the Aichi Biodiversity Targets and the Sustainable Development Goals of the 2030 Agenda. More information on this and other coordinated audits can be accessed at: <https://www.olacefs.com/auditorias-coordinadas/>

SAls can carry out the following types of audits, in accordance with the International Standards of Supreme Audit Institutions (ISSAI):¹⁶

- A **financial audit** focuses on determining whether an entity's financial information is presented in accordance with the financial reporting structure and the applicable regulatory framework. This is achieved by obtaining sufficient and appropriate audit evidence to allow the auditor to express an opinion as to whether the financial information is free from material misstatement due to fraud or error.
- A **performance audit** focuses on determining whether interventions, programs and institutions are operating in accordance with the principles of economy, efficiency and effectiveness, as well as whether there is room for improvement. Performance is examined against appropriate criteria, and the causes of deviations from these criteria or other problems are analyzed. The objective is to answer key audit questions and make recommendations for improvement.
- A **compliance audit** focuses on determining whether a particular object complies with standards identified as criteria. The compliance audit is performed to assess whether activities, financial transactions and information comply with, in all relevant aspects, the rules governing the audited entity. These standards may include rules, laws, regulations, budget resolutions, policies, established codes, agreements or general principles that govern responsible financial management in the public sector and the conduct of public officials.

3.2. Importance of using environmental accounts in international and national environmental audits

As part of the System of National Accounts, SEEA data and indicators show consistency and integrity (across space and time) and coherence with other statistics (for example, SNA monetary aggregates).¹⁷ As part of the national accounting system, environmental economic accounts must also be compiled

¹⁶<https://portal.tcu.gov.br/fiscalizacao-e-controle/auditoria/normas-internacionais-das-entidades-fiscalizadores-superiores-issai/>

¹⁷The monetary aggregates of the SNA include four categories of assets (from M1 to M4) and are ordered according to their liquidity: M1's are highly liquid, such as paper money and bank deposits; M2's include M1's assets and interest-bearing time deposits; M3's include M2's category assets and fixed income fund raising and SELIC registered securities; and M4's include M3's assets and federal government bonds.

in an institutionalized and periodic manner. Therefore, SAIs operating in countries where SEEA accounts are compiled regularly will benefit from immediate access to a variety of indicators derived from the SEEA to support environmental auditing. This directly addresses some of the main issues that SAIs face to ensure relevant and quality data for environmental audits (INTOSAI, 2013).

From the SEEA's various accounting modules, indicators can be obtained to support environmental audit processes involving various sectors related to the environment. In addition, the SEEA can provide indicators to report on all stages of the public policy life cycle, from problem identification, policy formulation and implementation to policy monitoring and review (Bass et al., 2017). Therefore, the SEEA can support SAIs in their environmental audit activities.

It is worth highlighting the common principles of SAIs and the production of national statistics. SAIs are respected and trusted in their role of reporting on the integrity of the public sector in view of their fundamental principles of independence, transparency and accountability, ethics and quality control (OECD, 2016). Likewise, the Fundamental Principles of Official Statistics also establish a commitment to adhere to well-defined professional and ethical standards in the production of national statistics. These principles are adopted by the UN General Assembly (through resolution A/RES/68/261 in 2014) and the independence of the National Statistics Institutes is fundamental to these principles (UNSD, 2015). As such, the SEEA provides information in the same line of independence and quality assurance under which SAIs must operate.

3.3. The use of accounts for the different audits

As an output of the WGEA, INTOSAI provides an overview of how the SEEA can support environmental audits and how SAIs can contribute to the development of robust and policy-relevant economic and environmental indicators and accounts (INTOSAI, 2010). At the time the INTOSAI (2010) report was developed and published, the SEEA water subsystem had been launched (2007) and the process of revising the SEEA Central Framework (SEEA-CF) to an international standard was under development. Consequently, it is now very relevant to provide an updated report following the recent approval of Ecosystem Accounts as an international statistical standard in 2021. There is now also substantial experience in the application of the SEEA-CF and the System of Environmental Economic Accounting - Experimental Ecosystem Accounting (SEEA EEA) from around the world, which can be drawn on to show the emerging possibilities for using the SEEA to support environmental auditing. Since the structure of the System of Environmental Economic Accounting - Ecosystem Accounting (SEEA-EA) was recently approved as an international statistical standard, SAIs can also play an important role in guiding their development in a way that can inform and support good environmental governance.

Thematic Applications

An important observation of the countries' experiences in applying the SEEA is that the accounting modules can report on a range of environmental policy objectives, topics, development perspectives

and analytical objectives. This subsection analyzes the links between the SEEA and environmental audits on topics of common interest.

Biodiversity

The importance of biodiversity for human well-being (of present and future generations) is well established in studies of various initiatives (via IPBES, TEEB and MA) and enshrined in several international commitments (for example, the SDGs and the Aichi Biodiversity Targets of the Convention on Biological Diversity - CBD). The recognition of the benefits that biodiversity provides to the economy and society is evidenced by the number of SAIs around the world that now carry out biodiversity audits. INTOSAI guidelines for SAIs on biodiversity audits identify that 133 audit reports were completed by SAIs between 2007 and 2015 (INTOSAI, 2019).

INTOSAI guidelines also reveal that there are several entry points where information from environmental economic accounts can support biodiversity audits (INTOSAI, 2019). The regular compilation of accounts, according to the SEEA, provides a time series perspective on the status and relationship between economic sectors, society and biological resources and diversity. This provides a cross-cutting perspective that will help identify the main threats to biodiversity contributing to the scope and implementation of the audit. For example:

- Ecosystem extent and condition accounts under the SEEA-EE provide information on ecosystem stocks (their extent and condition) and the SEEA-CF physical asset accounts provide information on key environmental resources (for example, fishery, timber and water stocks). These data can assist in monitoring the performance of environmental policies.
- Ecosystem services accounts under the SEEA EA reveal the contribution of these benefits to the national economy and well-being in physical and monetary terms. They can provide information on the opportunity costs of biodiversity conservation in terms of lost ecosystem services (for example, lost revenue from timber products). This can help to assess the economic effectiveness of different environmental integration policies or the adoption of solutions based on nature.
- Collectively, the SEEA EA ecosystem accounts, provide information on pressures from land conversion and habitat loss (through extent accounts), ecosystem degradation (through condition accounts) and overexploitation potential (through ecosystem services supply and use accounts). This can help to assess the performance of environmental impact prevention policies.
- Physical (waste) flow accounts, according to the SEEA-CF, provide information on pollution emissions, nutrient loading and greenhouse gas emissions. The associated trends will be useful for assessing progress against national climate change mitigation targets.
- The SEEA-CF Environmental Protection Expenditure Accounts could be developed to link financial transactions to changes in ecosystems and other biodiversity indicators. These can provide information on the ecological return on investment in the environment.
- Thematic accounting for biodiversity in the SEEA-EA can provide a set of cross-cutting accounting results that specifically address the main concerns related to biodiversity in a country, including natural ecosystems, species status, distribution and abundance (for example, King et al., 2021). This can help assess the performance of biodiversity conservation policies.

A fundamental advantage of the SEEA is its ability to link the economic benefits supplied by ecosystems and biodiversity to different sectors and parts of society. Likewise, the relationship between the different economic actors and the impacts on biodiversity can be better articulated via the accounting modules of the SEEA. This can directly support an integrated planning approach that better considers biodiversity and recognizes the multiple benefits it provides, while mitigating unnecessary impacts. At the same time, a better link between biodiversity and the economy will be of direct relevance in environmental audits and in the integration of biodiversity in development planning. Practical examples of how the SEEA can support better decisions with respect to biodiversity were presented at the 3rd Policy Forum on Natural Capital Accounting for Better Decision Making (Vardon, Bass, et al., 2019).

The process of defining a set of new goals for the CBD's Post-2020 Global Biodiversity Framework by 2030 is underway and is expected to be approved in 2021. However, the potential role of the SEEA as a reliable and comparable source of information on the environment, ecosystems and associated benefits for measuring progress towards these and other biodiversity goals, has already been identified, as shown in UNSD (2018b). Such use could support a national audit on the performance of related environmental policies.

Climate Change

Climate change is also identified as a thematic application of ecosystem accounting according to the SEEA-EA. The state of the art in applying the SEEA to inform better mitigation and adaptation policies to climate change was the second topic explored in the proceedings of the 3rd Policy Forum on Natural Capital Accounting for Better Decision Making (Vardon, Bass, et al., 2019). Several relevant case studies from different countries are provided in the proceedings of this forum.

INTOSAI/WGEA has produced guidelines for auditing governments' response to climate change (INTOSAI, 2013). In the context of these guidelines, the SEEA can provide the following information regarding actions to mitigate and adapt to climate change:

- Ecosystem extent accounts, according to the SEEA-EA, show conversions in types of ecosystems that are directly associated with changes in the absorption and release of carbon. This can be associated with greenhouse gas (GHG) emissions resulting from land use, land use change and forestry (LULUCF) and the performance of land use policies with regard to mitigating climate change.
- Ecosystem condition accounts, according to the SEEA-EA, can be structured to provide information about carbon stored in ecosystems (organic carbon in the soil, above-ground biomass). This can help assess the performance of ecosystem-based approaches in mitigating climate change.
- Ecosystem services accounts, according to the SEEA-EA, can provide information on the contributions of ecosystems to the regulation of GHGs in the atmosphere. They can also provide relevant information for applying an ecosystem approach to adapting to climate change. For instance, in identifying ecosystems that provide flood risk mitigation and regulation of rainfall regimes and the beneficiaries of these ecosystem services. Monetary

accounts for ecosystem services can inform economic analyses of the benefits of ecosystem-based approaches to mitigating and adapting to climate change.

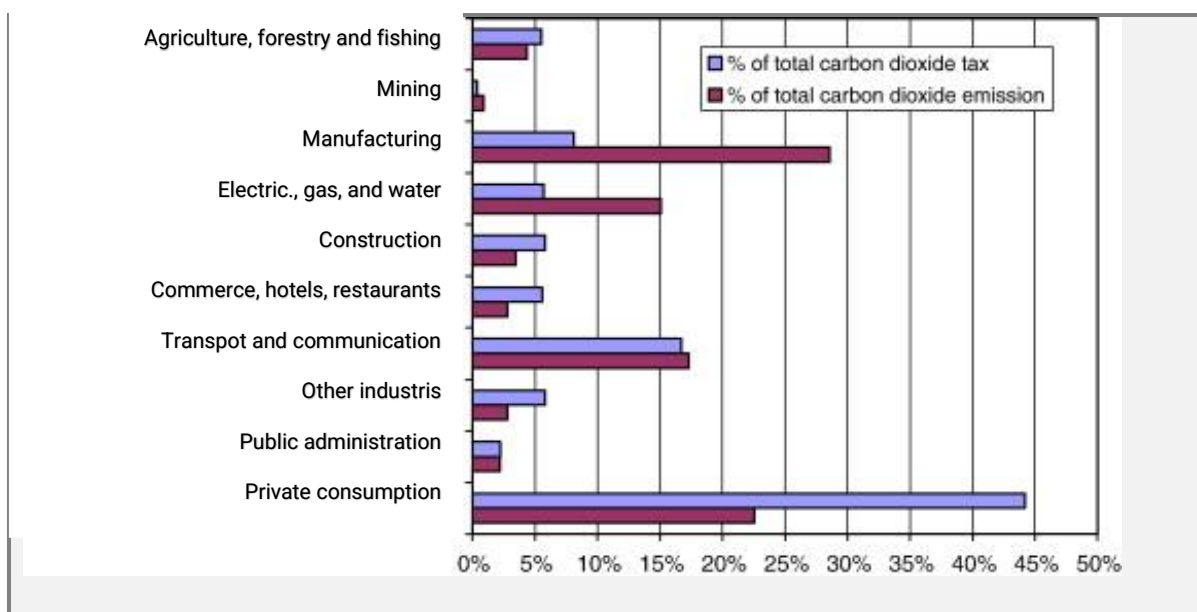
- A thematic carbon account is also proposed in the SEEA EA. The goal is to reveal the distribution of global carbon stocks on land, in ecosystems, in the economy, in the oceans and in the atmosphere, and how they vary over an accounting period. This account can provide a wide range of indicators to support environmental audits. The Netherlands provides a good example of these accounts developed using the SEEA EEA (CBS & WUR, 2017).
- The SEEA-CF's atmospheric emissions account records the generation of GHG emissions by different economic units. The associated trends will be useful to assess the performance of measures to mitigate these emissions.
- The SEEA-CF environmental activity accounts provide information in monetary terms on transactions that can be considered "environmental" between the different economic units. Generally, these environmental activities refer to activities carried out to preserve and protect the environment. These transactions include expenditures with environmental protection and statistics on the sector of environmental goods and services. An example is transactions related to activities to control greenhouse gas emissions and activities related to energy saving and renewable energy production. Environmental activity accounts also allow for the recording of environmental taxes paid to the government and environmental subsidies paid by governments. As such, the accounts for environmental activities can be linked to other accounts to provide insight into the effectiveness and economic efficiency of environmental taxes, subsidies, and protection expenditures in mitigating and adapting to climate change. Palm & Larsson (2007) provide an example connecting GHG emission accounts to environmental taxes [see **BOX 5 - Using SEEA to assess the impact of taxes on carbon emissions by sector in Sweden**]

BOX 5 - Using the SEEA to assess the impact of taxes on carbon emissions by sector in Sweden

The Environmental Activity Accounts of the Central Framework of the SEEA (SEEA-CF) allow the creation of accounts for monetary flows linked to environmentally beneficial and environmentally harmful products/activities, for example, environmental tax accounts (which are actually tax accounts on environmentally harmful products), subsidies provided for environmentally beneficial activities or subsidies that are potentially harmful to the environment. In this way, some economic instruments can be registered directly in the Environmental Activity Accounts of the SEEA-CF.

These accounts were used in Sweden to understand how environmental taxes are comprehensively addressing the issues they seek to resolve.¹⁸ The figure below shows this analysis in the context of greenhouse gas emissions and taxes - combining data from the carbon emission account and the environmental activity account of SEEA-CF. Although the analysis was carried out in 2007, the principle of application remains the same. In this context, accounts can monitor the impact of economic instruments, both in terms of intended impacts and also help to monitor co-benefits.

¹⁸Palm, V. and Larsson, M., 2007. Economic instruments and the environmental accounts. *Ecological Economics*, 61 (4), pp.684-692: <https://www.sciencedirect.com/science/article/pii/S0921800906004605>



It is also important to note that the UN Economic Commission for Europe created a task force to define a set of internationally comparable statistics and indicators related to climate change that could be calculated using the SEEA in 2014. The task force provided a final report in 2017,¹⁹ in which 39 basic indicators related to climate change were proposed, 22 of which can be calculated from the SEEA-CF accounts and others from the SEEA-EA accounts.

Other thematic applications

A review of the studies and guidelines produced by the INTOSAI Working Group on Environmental Auditing (WGEA) reveals that many topics have been the subject of environmental audit efforts. The SEEA was conceived as a flexible and multifunctional structure that can inform on several public policy topics. With suitable investment in thematic, spatial and temporal resolution of data to inform the SEEA accounts, indicators can be obtained that respond to many environmental policies and requirements. Table 4 provides a summary of the relationships between the different environmental audit topics identified and the aggregated statistics and relevant indicators that can be obtained from the SEEA.

Table 4 - Relevance of the SEEA to the different topics of environmental audits (own elaboration)

Environmental audit topic	Relevance of the SEEA
Environmental Health (focus on air pollution)	According to the SEEA, air emissions accounts provide information on emissions of pollutants released into the air by economic units. The environmental activity accounts of the SEEA-CF provide information on activities to mitigate these emissions.
Green cities - Sustainable urban development	Urban ecosystem accounting is also proposed as an accounting topic in the SEEA-EA. The structure has now been tested in Manchester (United

¹⁹https://unece.org/fileadmin/DAM/stats/documents/ece/ces/2016/mtg/19-Report_on_climate_indicators_final.pdf

Environmental audit topic	Relevance of the SEEA
	Kingdom), Oslo (Norway) and South Africa. The possibilities were assessed at the SEEA EEA 2019 Forum of Experts. ²⁰
Waste water	The SEEA-CF and the SEEA-Water subsystem provide detailed statistics on wastewater created and treated by the economy, and its return to the environment. In this context, the SEEA-Water information is directly relevant to the calculation of the SDG 6.3.1 indicator.
Agriculture and food production	The SEEA Agriculture, Forestry and Fisheries subsystem provides a series of statistics on agricultural performance (FAO & UNSD, 2018).
Land use and soil quality management to combat desertification	Ecosystem extent accounts under the SEEA-EA and land use accounts under the SEEA-CF provide information on land use in a country. Soil asset accounts are proposed in the SEEA-CF. Ecosystem condition accounts can also provide important information about soil quality, such as Soil Organic Carbon and nutrient content. The implications of land degradation on productivity can also be reflected in reductions in the supply of ecosystem services registered in the Ecosystem Services Accounts according to the SEEA-EA. It is recognized that the sub-indicators related to the generation of global benefits of the UN Convention to Combat Desertification (UNCCD-3) are, in principle, aligned with the SEEA-EA framework. Options on how the SEEA-EA and indicator 15.3.1 reporting can best be supported by the SEEA are being actively pursued.
Energy efficiency/Renewable energy	The SEEA-Energy subsystem is a multifunctional structure for organizing energy-related statistics. It supports the analysis of the role of energy in the economy, the state of energy inputs and various energy related transactions of environmental interest (UNSD, 2019). The subsystem can support the calculation of SDG indicators 7.2.1 on Renewable Energy and 7.3.1 Energy intensity of GDP in aggregate and sector indicators.
Waste Management	The SEEA-Central Framework provides a table with data on the production of solid waste. This breaks down the total generation of waste by different sources (industries, homes, etc.) and by solid waste types. The total solid waste treated by the waste management industry is recorded in the SEEA CF table for physical use of solid waste.
Land Use and Land Management Practices from an Environmental Perspective	The potential to integrate an ecosystem perspective into land use changes is facilitated through the SEEA EEA Accounts and the SEEA-CF Land Use Accounts. Ecosystem Accounts defined in the SEEA EA can link changes in land use to impacts on the extent of natural ecosystems, their condition (including sets of associated species) and impacts on the set of services and goods provided by ecosystems.

²⁰<https://seea.un.org/events/2019-forum-experts-seea-experimental-ecosystem-accounting#:~:text=The%20Forum%20of%20Experts%20on%20the%20Coversation%20New%20York%20USA.&text=Share%20experiences%20and%20best%20practices,Valuation%20of%20Ecosystem%20Services%20project>.

Environmental audit topic	Relevance of the SEEA
Impact of tourism on wildlife conservation	Ecosystem extent and condition accounts, according to the SEEA-EA, can provide an articulation between wildlife stocks (i.e., natural ecosystems and the species they support) and the level of ecosystem services related to tourism that are provided by these stocks. This can provide insight into the economic benefits of investing in wildlife conservation and where ecosystem services related to tourism may be overused. It is worth noting that these relations are being developed for tourism within the framework of a project of the United Nations World Tourism Organization (UNWTO) to measure the Sustainability of Tourism. ²¹ This includes measuring the environmental dimensions of sustainability, encompassing the environmental assets, often referred to as natural capital, that support tourism activity.
Water resources	SEEA-Water accounts record the hydrological system and its links to the economy. They provide a coherent set of statistics on water flows between the environment and the economy, water stocks in different components of the hydrological cycle, and economic information on the costs associated with water use and supply (UN, 2012). The SEEA-Water accounts can be supplemented with information from the SEEA Ecosystem Extent and Condition Accounts, particularly with regard to the extent and condition of water-related ecosystems. Collectively, these accounts are relevant to a number of SDG 6 indicators.
Disaster risk reduction	Ecosystem-based approaches to address disaster risk reduction (or nature-based solutions for resilience) are increasingly being advocated (e.g., UNDRR, 2020). Ecosystem services accounts under the SEEA-EA can provide a framework for integrating regulatory and supply services that can contribute to disaster risk reduction (e.g., flood protection, food security, etc.). In addition, ecosystem extent and condition accounts can track trends in ecological integrity and provide insight into potential risks of tipping points (inflection points, or points of change of ecological balance), beyond which catastrophic losses in ecosystem services supply may occur.
Auditing the Implementation of Multilateral Environmental Agreements (MEAs)	The SEEA can provide several indicators to report progress towards multilateral environmental agreements. UNSD identifies that the SEEA can support the calculation or integration of 74 identified indicators to measure progress in reaching the CBD's Aichi biodiversity targets, 40 indicators to measure progress in reaching the SDGs, UNCCD sub-indicators, and directly complements the UNFCCC inventory information. ²²

²¹<https://www.unwto.org/standards/working-group-of-experts-on-mst>

²²<https://seea.un.org/content/applications-seea>

Sustainable Development, Integrated Planning, the SEEA and their relationship with Environmental Audits

To enable countries to assess progress towards achieving the 2030 Agenda and its 17 Sustainable Development Goals (SDGs), the UN Statistics Committee has endorsed a Global Indicator Framework composed of 232 SDG target indicators. As highlighted earlier in the introduction, the SEEA can contribute to the calculation of a series of these indicators, particularly for SDGs 6, 13, 14 and 15.

UNSD (2019) and Ruijs et al. (2018) provide a useful overview of the possibilities in this regard. This can directly benefit SAIs by simplifying data collection for auditing performance. There is also a key role for the SEEA in supporting a holistic and integrated approach to auditing the SDGs (INTOSAI, 2017). As highlighted by INTOSAI, the SDGs are based on the recognition that economies, societies and the environment are closely connected. In short, social and economic development depends on keeping within certain environmental limits (or resource bases) and the environmental degradation impacts on economic prosperity and social well-being. Consequently, environmental auditing in the SDG space can consider the economic or social causes of environmental degradation, or the positive economic or social impacts of environmental protection and improvement programs.

The conflicting objectives of economic growth, environmental protection and social development can make it difficult to implement environmental measures and meet all sustainable development goals.²³ The environmental auditing and accounting communities understand that the challenge of achieving sustainable development requires institutional reform that promotes better integration of economic policies (INTOSAI, 2017). This integration involves assessing trade-offs and mitigating impacts (safeguards) and identifying synergies (capturing co-benefits) between different policies (Bass et al., 2017). SAIs recognize their role in ensuring that institutional reform continues at the pace needed to support this path. As the SEEA integrates information on the environment into the economy and the wider societal benefits nature delivers, it can also provide crucial data and metrics to inform, guide and assess governments' progress towards more integrated planning for sustainable development. For example:

- Ecosystem extent accounts (SEEA EA) and land use accounts (SEEA CF) : Reveal how different economic decisions on land use impact natural ecosystems. As these ecosystems are degraded, the biodiversity they support and the ecosystem services they supply are also impacted.
- Emission accounts (SEEA-CF): Link pollution emissions to different economic units and reveal the intensity of emissions associated with increased activity in certain sectors of the economy (Ruijs et al., 2018).
- Flow accounts (physical) (SEEA-CF): Link the use of environmental inputs to different economic activities, revealing the intensity of the use of natural resources from different economic sectors and their sustainability (Ruijs et al., 2018).
- Ecosystem service use and supply accounts (SEEA-EA): Provide insights similar to the Central Framework physical flow accounts, but also include a wider range of nature's benefits for

²³<https://www.giz.de/en/downloads/Factsheet%20Auditorias%20Ambientais%20ENG%20v11.2018.pdf>

human well-being. They provide insight into which investments in ecosystems guarantee regulatory services that contribute to social well-being and economic security (for example, nature-based solutions to protect against floods and storms; World Bank, 2016).

- Ecosystem service use and supply accounts (SEEA-EA): Link the benefits of ecosystem services to different users of development policy concern. For instance, revealing where investment in ecosystems may be relevant for poverty alleviation (example in Eigenraam & Choi, 2017).
- Ecosystem service use and supply accounts (SEEA-EA): Provide a connection to a series of monetary aggregates relevant to biodiversity that exist in the National Accounting System (e.g., food supply, wildlife tourism, recreational activities in nature). These aggregates can also be linked to the elements of biodiversity that support their supply through the SEEA-EA. They can also report on monetary compensations/opportunity costs associated with different management approaches to biodiversity (conservation versus development) and identify which sectors should be developed to provide better outcomes for biodiversity.

The SEEA's ability to reveal trade-offs and synergies between the three dimensions of sustainable development makes it a key tool for development planning. It can, for example, support the identification of policies and institutions that promote investments in biodiversity by achieving co-benefits for human well-being (such as poverty reduction).

The SEEA and coordinated audits

The last point worth noting is that the SEEA framework has been developed over many years and benefits from considerable experience and experimentation in its application. This has resulted in a statistical framework that considered many environmental measurement issues on how to produce consistent and internationally comparable statistics to reflect associated phenomena. The structure is also designed to be fully scalable and modular. As the SEEA is well established; it can provide a solid structure that can help SAIs in different countries to conduct coordinated audits on different topics. For example, the SEEA proposes the adoption of the IUCN Global Ecosystem Typology by all countries, providing a typology of condition indicators, reference lists for ecosystem services, and associated calculations and common assessment approaches (UNCEE, 2020). Therefore, the SEEA can contribute to the organization and harmonization of national environmental audit data in a region to provide a comprehensive and coherent picture of different environmental issues across the region.



**4. FUTURE
PERSPECTIVES IN THE
USE OF
ENVIRONMENTAL
ECONOMIC ACCOUNTS**

The regular provision of integrated economic and environmental information that the SEEA can provide will be directly relevant to many SAIs' environmental audit activities. The structure is flexible, adapting to different contexts, but providing consistent definitions and concepts. Consequently, it allows the harmonization of environmental data from various sources and offers coherence and consistency in statistics from different organizations. This system also ensures that information can be compared consistently over time and space. This can streamline data collection activities.

The implementation of the SEEA also establishes a centralized system for organizing information about the environment and the economy, thus reducing the possibilities for repetition of data collection activities in different government agencies. In addition, by organizing information from different agencies and sectors in a consistent manner, the SEEA opens the dialogue between these agencies and sectors and allows the trade-offs and synergies related to environmental management decisions to be revealed more easily.

SEEA data and information can also support a cost-benefit analysis of infrastructure projects and concessions, allowing potential environmental losses resulting from project implementation to be quantified and incorporated into their costs. The potential of the SEEA is not limited to environmental audits, but to several other areas of external control action, including the economic and infrastructure sectors.

The implementation of the SEEA offers benefits to a number of potential users in terms of quality assurance, consistency and regular updates. The SEEA-CF has been gradually adopted by countries in recent years. However, relatively few cases have established ecosystem accounting programs, although this is changing rapidly. The recent official adoption of SEEA-EA as an international statistical standard is likely to be a key factor for a broader implementation of Ecosystem Accounting via the SEEA.

As with any information system, the SEEA's ability to provide statistics for different purposes depends on the availability of environmental-economic data and resources being made available for the regular production and collection of such data. The contributions that the SEEA can provide also depend on the investments that countries make in the production of accounts in a spatially explicit manner using consistent classifications for ecosystem services and ecosystem users, and investing resources for the periodic production of accounts. The key to the future production of high-quality SEEA accounts is the establishment of institutional relationships between government agencies, particularly those mandated to regularly produce environmental monitoring data.

Given the similarities in the guiding principles, cooperation between SAIs and National Statistical Institutions in the context of the SEEA appears to be fertile ground to be explored. INTOSAI stresses that SAIs are uniquely positioned to help their governments move forward and improve account development (INTOSAI, 2010). As the Ecosystem Accounting structure (SEEA-EA) was recently

approved, SAIs can play an important role in guiding the implementation and development of this framework in a way that can inform and support good environmental governance. The exchange of information between SAIs and SEEA account producers will allow the improvement of ecosystem accounts, so that they can be even more useful as a source of information for future audits and external control actions.

There is also extensive technical experience in different environmental audit topics within SAIs that can contribute to the account production processes. In doing so, SAIs will improve the visibility of their work to a broader set of decision makers and environmental professionals. They will also contribute with a tool that can add great value to their own audits and analyses through more consistent and reliable economic and environmental data.

It is important to highlight some points of attention for the use of the SEEA in the context of environmental auditing and other purposes. The SEEA should not be seen as a panacea for all environmental data requirements. Instead, the SEEA aims to provide a structure to help inform economic and environmental analysis and planning at the macro level. For instance, by providing information on the relationship between national economic growth and environmental degradation and its potential impact on future generations. The structure is scalable and often applied on a subnational scale (i.e., it can be used at different scales to different spatial areas). However, in most cases, it will not provide information on the detailed aspects of conservation, the subtleties of the relationship between ecosystems and people at the local scale or the full range of social benefits provided by biodiversity. The structure also uses the concept of "exchange value" for the monetary evaluation of ecosystem services. This reflects a value that arises in market transactions. It is not the same as the total economic (or welfare) value of ecosystem services, which is often used in the cost-benefit analysis of public policies, although the SEEA-EA ecosystem services accounts clearly provide information for the calculation of such values. Finally, the SEEA tracks historical trends, so other tools are needed to use this data to predict and evaluate future scenarios and development options.

References

- Baldivieso, A. M., Andersen, L. E., & Chuvileva, L. M. (2017). *Global Green Accounting 2017. An annotated bibliography of green national accounting efforts around the world.*
- Bass, S., Ahlroth, S., Ruijs, A., & Vardon, M. (2017). Natural capital accounting for policy – a global view of achievements, challenges and prospects. In M. Vardon, S. Bass, S. Ahlroth, & A. Ruijs (Eds.), *Forum on Natural Capital Accounting for Better Policy Decisions: Taking Stock and Moving Forward.* (pp. 17–30). World Bank WAVES.
- Burnett, P., Vardon, M., Keith, H., King, S., & Lindenmayer, D. (2020). Measuring net-positive outcomes for nature using accounting. *Nature Ecology & Evolution*, 4(3), 284–285. <https://doi.org/10.1038/s41559-020-1108-7>
- Carvajal, F. (2017). Avances y desafíos de las cuentas económico-ambientales en América Latina y el Caribe. *Serie Estudios Estadísticos*, 95, 133.
- CBS, & WUR. (2017). *The SEEA EEA carbon account for the Netherlands.* <https://www.cbs.nl/en-gb/background/2017/45/the-seea-eea-carbon-account-for-the-netherlands>
- CEPAL, & WAVES. (2017). Avances y desafíos de las cuentas económico-ambientales en América Latina y el Caribe. *Serie Estudios Estadísticos.* https://repositorio.cepal.org/bitstream/handle/11362/43314/1/S1700990_es.pdf
- Dasgupta., P. (2021). *The Economics of Biodiversity: The Dasgupta Review.* <https://www.gov.uk/government/publications/final-report-the-economics-of-biodiversity-the-dasgupta-review>
- Eigenraam, M., & Choi, S. (2017). *Poverty-Environment Accounting Framework (PEAF) Application to Public Expenditure Reviews to measure and report on the Poverty-Environment Nexus and Sustainable Development Goals (SDG).*
- Eigenraam, M., & Obst, C. (2018). Extending the production boundary of the System of National Accounts (SNA) to classify and account for ecosystem services. *Ecosystem Health and Sustainability*, 4(11), 247–260. <https://doi.org/10.1080/20964129.2018.1524718>
- FAO, & UNSD. (2018). *System of Environmental-Economic Accounting for Agriculture, Forestry and Fisheries: SEEA AFF White Cover version.* http://www.fao.org/fileadmin/templates/ess/ess_test_folder/Publications/Agrienvironmental/SEEA_AFF_White_Cover.pdf
- GIZ. (2019a). *A Contribuição das Contas Econômicas Ambientais nas Políticas Públicas no Brasil: água.* Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH.
- GIZ. (2019b). *A contribuição das Contas Econômicas Ambientais nas políticas públicas no Brasil: energia.* Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH.
- GIZ. (2019c). *A contribuição das Contas Econômicas Ambientais nas políticas públicas no Brasil: florestas.* Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH.
- GIZ. (2019d). *Contas Econômicas Ambientais: O que são?* Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH.
- Hein, L., Bagstad, K. J., Obst, C., Edens, B., Schenau, S., Castillo, G., Soulard, F., Brown, C., Driver, A., Bordt, M., Steurer, A., Harris, R., & Caparrós, A. (2020). Progress in natural capital accounting for ecosystems. *Science*, 367(6477), 514 LP – 515. <https://doi.org/10.1126/science.aaz8901>
- IBGE. (2020). Contas econômicas ambientais da água: Brasil 2013-2017. *Contas Nacionais n. 72 • ISSN 1415-9813, d(1).*

- INTOSAI. (2010). *Environmental Accounting: Current Status and Options for SAIs*.
https://www.environmental-auditing.org/media/2920/2010_wgea_environmental_accounting_a4_web.pdf
- INTOSAI. (2013). *Environmental Data: Resources and Options for Supreme Audit Institutions*.
https://www.environmental-auditing.org/media/2942/2013_wgea_environmental-data_view.pdf
- INTOSAI. (2017). *Environmental Audit and the Sustainable Development Goals*.
https://www.environmental-auditing.org/media/113691/21h-wgea_sdgs_18-sep-2019.pdf
- INTOSAI. (2019). *Auditing Biodiversity: Guidance for Supreme Audit Institutions*.
https://environmental-auditing.org/media/113694/24a-wgea_biodiversity_corbel_18-sep-2019.pdf
- Keith, H., Vardon, M., Stein, J. A., Stein, J. L., & Lindenmayer, D. (2017). Ecosystem accounts define explicit and spatial trade-offs for managing natural resources. *Nature Ecology and Evolution*, 1(11), 1683–1692. <https://doi.org/10.1038/s41559-017-0309-1>
- King, S., Vardon, M., Grantham, H. S., Eigenraam, M., Ferrier, S., Juhn, D., Larsen, T., Brown, C., & Turner, K. (2021). Linking biodiversity into national economic accounting. *Environmental Science and Policy*, 116(February 2021), 20–29. <https://doi.org/10.1016/j.envsci.2020.10.020>
- OECD. (2016). *Supreme Audit Institutions and Good Governance: Oversight, Insight and Foresight*.
<https://doi.org/10.1787/9789264263871-en>
- Quiroga, R. (2018). Avances y desafíos de las cuentas económico-ambientales en América Latina y el Caribe. *Taller Regional de Contabilidad Experimental de Los Ecosistemas Para Los Países de ALC. Noviembre 21 – 23, 2018*.
https://repositorio.cepal.org/bitstream/handle/11362/43314/1/S1700990_es.pdf
- Repetto, R. (1992). Accounting for environmental assets. *Scientific American*, 266(6), 94–101.
- Ruijs, A., van der Heide, M., & van den Berg, J. (2018). Natural Capital Accounting for the Sustainable Development Goals: Current and potential uses and steps forward. In A. Ruijs & M. Vardon (Eds.), *2nd Policy Forum on Natural Capital Accounting for Better Decision Making Applications for Sustainable Development* (pp. 31–67). World Bank WAVES, Washington D.C.
[https://www.wavespartnership.org/sites/waves/files/kc/2nd Policy Forum_Publication part 1.signed.pdf](https://www.wavespartnership.org/sites/waves/files/kc/2nd%20Policy%20Forum_Publication%20part%201.signed.pdf)
- Ruijs, A., & Vardon, M. (2018). *2nd Policy Forum on Natural Capital Accounting for Better Decision Making: Applications for Sustainable Development*. <https://www.wavespartnership.org/en/policy-forum-natural-capital-accounting-better-decision-making>
- UN. (2012). *SEEA-Water: System of Environmental-Economic Accounting for Water*.
<https://unstats.un.org/unsd/envaccounting/seeaw/seeawaterwebversion.pdf>
- UN, European Commission, FAO, IMF, OECD, & World Bank. (2014). *System of Environmental Economic Accounting 2012—Central Framework*.
http://unstats.un.org/unsd/envaccounting/seeaRev/SEEA_CF_Final_en.pdf
- UN Statistical Commission. (2021). *Draft Decisions - Agenda item 7: Report of the Commission on its fifty-second session (Issue March)*.
- UN, UNEP, CBD, & Norwegian Ministry of Foreign Affairs. (2017). *Technical Recommendations in support of the System of Environmental-Economic Accounting 2012. White cover publication*.
- UNCEEA. (2018). *The Role of the System of Environmental- Economic Accounting as a Measurement Framework in Support of the post-2020 Agenda. December 2018*.
- UNCEEA. (2020). *System of Environmental-Economic Accounting— Ecosystem Accounting: Draft for the Global Consultation on the complete document (October 2020)*.
- UNDRR. (2020). *Ecosystem-Based Disaster Risk Reduction: Implementing Nature-based Solutions for*

Resilience. <https://www.undrr.org/media/48333/download>

- UNEP-WCMC, & UNSD. (2019). *Assessing the linkages between global indicator initiatives, SEEA Modules and the SDG Targets*. <https://seea.un.org/content/applications-seea>
- UNGA. (2015). *Resolution adopted by the General Assembly on 19 December 2014 - A/RES/69/228*.
- UNSD. (2015). *United Nations Fundamental Principles of Official Statistics - Implementation guidelines*.
- UNSD. (2018a). *Global Assessment of Environmental-Economic Accounting and Supporting Statistics 2017. Statistical Commission, March, 37*. <https://unstats.un.org/unsd/statcom/49th-session/documents/BG-Item3h-2017-Global-Assessment-of-Environmental-Economic-Accounting-E.pdf>
- UNSD. (2018b). *The Role of the System of Environmental-Economic Accounting as a Measurement Framework in Support of the post-2020 Agenda* (14 December 201). https://seea.un.org/sites/seea.un.org/files/seea_as_a_measurement_framework_in_support_of_the_post-2020_agenda_1.pdf
- UNSD. (2019). *System of Environmental-Economic Accounting for Energy: SEEA-Energy*. https://seea.un.org/sites/seea.un.org/files/documents/seea-energy_final_web.pdf
- UNSD. (2021). *System of Environmental-Economic Accounting—Ecosystem Accounting: Final Draft*.
- Vardon, M., Bass, S., & Ahlroth, S. (2019). *Natural Capital Accounting for Better Policy Decisions: Climate change and Biodiversity. 3rd Forum on Natural Capital Accounting for Better Policy Decisions*, 158. <https://www.wavespartnership.org/en/knowledge-center/natural-capital-accounting-better-policy-decisions-climate-change-and-biodiversity>
- Vardon, M., Bass, S., Ahlroth, S., & Ruijs, A. (Eds.). (2017). *Forum on Natural Capital Accounting for Better Policy Decisions: Taking Stock and Moving Forward*. World Bank WAVES,. <https://www.wavespartnership.org/en/knowledge-center/forum-natural-capital-accounting-better-policy-decisions-taking-stock-and-moving>
- Vardon, M., Castaneda, J.-P., Nagy, M., & Schenau, S. (2018). *How the System of Environmental-Economic Accounting can improve environmental information systems and data quality for decision making. Environmental Science & Policy, 89*, 83–92. <https://doi.org/10.1016/j.envsci.2018.07.007>
- Vardon, M., Keith, H., Obst, C., & Lindenmayer, D. (2019). *Putting biodiversity into the national accounts: Creating a new paradigm for economic decisions. Ambio, 48*, 726–731. <https://doi.org/10.1007/s13280-018-1114-z>
- World Bank. (2016). *Managing Coasts with Natural Solutions: Guidelines for Measuring and Valuing the Coastal Protection Services of Mangroves and Coral Reefs* (M. W. Beck & G.-M. Lange (Eds.)). <http://documents1.worldbank.org/curated/en/995341467995379786/pdf/Managing-coasts-with-natural-solutions-guidelines-for-measuring-and-valuing-the-coastal-protection-services-of-mangroves-and-coral-reefs.pdf>
- Young, C. E. F. (2019). YOUNG, C. E. F. *Apoio ao Desenvolvimento das Contas Econômicas Ambientais*, in GIZ (org.) *Experiências & Aprendizados do Projeto TEEB Regional-Local - 'Conservação da Biodiversidade através da Integração de Serviços ecossistêmicos em Políticas Púb. In Experiências & Aprendizados: Conservação da Biodiversidade através da Integração de Serviços ecossistêmicos em Políticas Públicas e na Atuação Empresarial* (Issue June). https://www.academia.edu/39794225/YOUNG_C._E._F._Apoio_ao_Desenvolvimento_das_Contas_Econômicas_Ambientais_in_GIZ_org._Experiências_and_Aprendizados_do_Projeto_TEEB_Regional-Local_-_Conservação_da_Biodiversidade_atraves_da_Integração_de_Serviços_ecossistêmicos

Attachment 1. Recommended Bibliography

BALDIVIESO, A. M.; ANDERSEN, L. E.; CHUVILEVA, L. M. [Global Green Accounting 2017. An annotated bibliography of green national accounting efforts around the world.](#) December 2017. Fundación INESAD. La Paz, Bolivia.

CARJAVAL, F. [Countries in Latin America and the Caribbean make progress implementing Natural Capital Accounting.](#) 2017. Página web de WAVES.

CARVAJAL, F. La contribución de las cuentas ambientales al seguimiento de los ODS. Conferencia presentada en el Seminario Estadísticas Ambientales América Latina. Rio de Janeiro: CEPAL/UN Environment/IBGE. Dic. 2017.

CARVAJAL, F. [Avances y desafíos de las cuentas económico-ambientales en América Latina y el Caribe.](#) Comisión Económica para América Latina y el Caribe (CEPAL). 2017.

CEPAL. 2017. [Indicadores de producción verde: Una guía para avanzar hacia el desarrollo sostenible.](#) José L. Cervera-Ferri y Mónica Luz Ureña. Documento de Proyecto. Comisión Económica para América Latina y el Caribe (CEPAL). Naciones Unidas, febrero de 2017.

GIZ. [Contas Econômicas Ambientais: O que são?](#) Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH. Brasília/DF: 2019. 28 p.

IBGE. [Contas de ecossistemas: o uso da terra nos biomas brasileiros: 2000- 2018](#) / IBGE, Coordenação de Recursos Naturais e Estudos Ambientais, Coordenação de Contas Nacionais. - Rio de Janeiro: IBGE, 2020.

IBGE. [Contas de ecossistemas: espécies ameaçadas de extinção no Brasil: 2014/](#) IBGE, Coordenação de Recursos Naturais e Estudos Ambientais, Coordenação de Contas Nacionais. - Rio de Janeiro: IBGE, 2020.

IBGE. [Contas econômicas ambientais da água: Brasil 2013-2017](#) / IBGE, Coordenação de Contas Nacionais. - Rio de Janeiro: IBGE, 2020.

INTOSAI. [Environmental Accounting: Current Status and Options for SAIs.](#) Washington DC. International Organization of Supreme Audit Institutions (INTOSAI).

KING, S.; MOUL, K.; BROWN, C. and VAUSE, J. [Assessing the linkages between global indicator initiatives, SEEA modules and the SDG targets: Draft working document.](#) 18 June 2018.

KING, S.; VARDON, M.; GRANTHAM, H. S.; EIGENRAAM, M.; FERRIER, S.; JUHN, D., LARSEN, T.; BROWN, C.; TURNER, K. [Linking biodiversity into national economic accounting.](#) Environmental Science & Policy. Volume 116, February 2021, Pages 20-29

PIRMANA, V.; ALISJAHBANA, A. S.; HOEKSTRA, R. and TUKKER, A. [Implementation Barriers for a System of Environmental-Economic Accounting in Developing Countries and Its Implications for Monitoring Sustainable Development Goals.](#) Sustainability 2019, 11, 6417; doi:10.3390/su11226417

QUIROGA, R. [Indicadores ambientales y de desarrollo sostenible: avances y perspectivas para América Latina y el Caribe](#). Santiago de Chile: Naciones Unidas CEPAL, División de Estadística y Proyecciones Económicas. 2007

RUIJS, A.; VARDON, M. [Natural capital accounting: Growing experience and testing the 10 living principles to make it fit for policy](#). In Arjan Ruijs, Michael Vardon (eds), 2nd Policy Forum on Natural Capital Accounting for Better Decision Making: Applications for Sustainable Development (pp.83-99), Chapter 4, Publisher: World Bank - WAVES, Netherlands, 2018.

SDSN. [Indicators and a Monitoring Framework for Sustainable Development Goals: Launching a data revolution for the SDG](#). Sustainable Development Solutions Network, Paris and New York. 2015.

UN. [How Natural Capital Accounting Contributes To Integrated Policies For Sustainability](#). United Nations, 2020.

UN. [Natural Capital Accounting For Integrated Biodiversity Policies](#). United Nations, 2020.

UN. [Natural Capital Accounting For Integrated Climate Change Policies](#). United Nations, 2020.

UN. [Natural Capital Accounting For Sustainable Macroeconomic Strategies](#). United Nations, 2020.

UN. System of Environmental-Economic Accounting for Water (SEEA-Water). [SPANISH](#), [ENGLISH](#), United Nations, 2020.

UN. [System of Environmental-Economic Accounting for Energy \(SEEA-Energy\)](#). United Nations, 2019.

UN. [Technical Recommendations in support of the SEEA-Experimental Ecosystem Accounting \(SEEA-EEA\)](#). United Nations, 2019.

UN et al. [SEEA Applications and Extensions](#). United Nations, 2017.

UN et al. SEEA-Central Framework. [SPANISH](#). United Nations, 2014.

UN et al. SEEA-Central Framework. [PORTUGUESE](#). United Nations, 2016.

UN et al. [SEEA Experimental Ecosystem Accounting](#). United Nations, 2014.

UNCEEA. [The Role of the System of Environmental Economic Accounting as a Measurement Framework in Support of the post-2020 Agenda](#). United Nations Committee of Experts on Environmental-Economic Accounting. 2018.

UNEP-WCMC. [Experimental Biodiversity Accounting as a component of the System of Environmental-Economic Accounting Experimental Ecosystem Accounting \(SEEA-EEA\)](#). Supporting document to the Advancing the SEEA Experimental Ecosystem Accounting project. United Nations. 2015.

UNEP-WCMC. [Exploring Approaches for Constructing Species Accounts in the Context of SEEA-EEA](#). Cambridge, UK. 2016

UNESCO. [Educação para os Objetivos de Desenvolvimento Sustentável: objetivos de aprendizagem](#). Brasília: UNESCO, 2017.

VARDON, M.; BASS, S.; AHLROTH, S. and RUIJS, A. Forum on Natural Capital Accounting for Better Policy Decisions: Taking Stock and Moving Forward. Washington: World Bank WAVES, 2017.

VARDON, M.; BIRT, J.; INGRAM, J. [Business and National Accounting for Natural Capital: Toward Improved Understanding and Alignment](#), in Michael Vardon, Steve Bass, Sofia Ahlroth and Arjan Ruijs (ed.), Forum on Natural Capital Accounting for Better Policy Decisions: Taking Stock and Moving Forward, World Bank Group, United States, 2017.

VARDON, M. et al. The Aichi Targets and biodiversity conservation – the role of natural capital accounting. In: Better policy through natural capital accounting: stock take and ways forward. Edition: APM Edition, Publisher: World Bank WAVES

WAVES, CEPAL e WORLD BANK. [Compendio de artículos sobre cuentas de energía y emisiones en los países de ALC](#). Antigua Guatemala: WAVES, CEPAL and World Bank. 2017

YOUNG, C. E. F. [Apoio ao Desenvolvimento das Contas Econômicas Ambientais](#). In: “Experiências e Aprendizados do Projeto TEEB Regional-Local”. Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH. Brasília/DF: 2019..

Attachment 2. Websites

Statistical Institutes Pages

- **Argentina** - Website of Argentina's Environmental Statistics:
<http://estadisticas.ambiente.gob.ar/>
- **Aruba** - Website of the Central Bureau of Statistics of Aruba: <https://cbs.aw/wp/>
- **Bahamas** - Website of the Department of Statistics of the Bahamas:
<http://www.barstats.gov.bb/>
- **Barbados** - Website of the Barbados Statistical Service: <http://www.barstats.gov.bb/>
- **Belize** - Website of the Statistical Institute of Belize: <http://www.statisticsbelize.org.bz/>
- **Bermuda** - Website of the Department of Statistics of Bermuda:
<https://www.gov.bm/department/statistics>
- **Bolivia** - Website of the National Statistical Institute (INE) of Bolivia website:
<https://www.ine.gob.bo/index.php/publicaciones/estadisticas-de-medio-ambiente-1994-2004/>
- **Brazil** - Environment Website (including Economic and Environmental Accounts) of the Brazilian Institute of Geography and Statistics (IBGE):
<https://www.ibge.gov.br/estatisticas/multidominio/meio-ambiente.html>
- **Chile** - Website of the National Statistics Institute (INE) of Chile:
<https://www.ine.cl/estadisticas/economia/energia-y-medioambiente>
- **Colombia** - Website of the National Administrative Department of Statistics - DANE - of Colombia: <https://www.dane.gov.co/index.php/estadisticas-por-tema/ambientales>
- **Costa Rica** - Website of the National Institute of Statistics and Census (INEC) of Costa Rica - Environmental indicators: <https://www.inec.cr/medio-ambiente/indicadores-ambientales>
- **Cuba** - Website of the National Statistical Office of Cuba: <http://www.inec.go.cr/>
- **Curacao** - Website of the Central Bureau of Statistics of Curaçao: <http://www.cbs.cw/>
- **El Salvador** - Website of the Ministry of Environment and Natural Resources of El Salvador | Report of Environmental Indicators: <https://cidoc.marn.gob.sv/documentos/informe-de-indicadores-ambientales-el-salvador-2018/>
- **Ecuador** - Website of the National Institute of Statistics and Censuses (INEC) of Ecuador:
<https://www.ecuadorencifras.gob.ec/estadisticas-ambientales/>
- **Guatemala** - Website of the Ministry of Environment and Natural Resources of Guatemala | Environmental indicators 2019: <https://www.marn.gob.gt/Multimedios/14603.pdf> | Page of the National Statistics Institute of Guatemala:
<https://www.ine.gob.gt/ine/estadisticas/bases-de-datos/estadisticas-ambientales/>
- **Guyana** - Website of the Bureau of Statistics of Guyana: <https://www.ine.gob.gt/>
- **Haiti** - Website of the Haitian Institute of Statistics and Informatics: <http://www.ihsi.ht/>

- **Honduras** - Website of the National Institute of Statistics of Honduras:
<http://www.ine.gob.hn/>
- **Jamaica** - Website of the Statistical Institute of Jamaica:
<https://statinja.gov.jm/Environmentdata.aspx>
- **Mexico** - Website of the National and Environmental Accounts of the National Institute of Statistics and Geography of Mexico (INEGI, *National Institute of Statistics and Geography*):
<https://www.inegi.org.mx/temas/ee/>
- **Nicaragua** - Website of the National Institute of Information and Development (INIDE):
<http://www.inide.gob.ni/>
- **Panama** - Website of the National Institute of Statistics and Census (INEC) of Panama:
https://www.inec.gob.pa/Publicaciones/Default2.aspx?ID_CATEGORIA=16&ID_SUBCATEGORIA=49
- **Paraguay** - Website of the Ministry of Environment and Sustainable Development (MADES) of Paraguay: <http://www.mades.gov.py/>
- **Peru** - Website of the National Institute of Statistics and Informatics (INEI) of Peru:
<https://www.inei.gob.pe/biblioteca-virtual/boletines/estadisticas-ambientales/1/>
- **Dominican Republic** - Website of the National Statistical Office of the Dominican Republic:
<http://www.one.gob.do/>
- **Saint Lucia** - Website of the Central Statistical Office of Santa Lucia:
<http://192.147.231.244:9090/stats/>
- **Suriname** - Website of the General Bureau of Statistics of Suriname: <http://www.statistics-suriname.org/>
- **Trinidad and Tobago** - Website of the Central Statistical Office: <http://cso.gov.tt/>
- **Uruguay** - Website of the Ministry of Housing and Territorial Planning (MVOTMA) - Environmental Indicators - from Uruguay: <https://www.gub.uy/ministerio-vivienda-ordenamiento-territorial/>
- **Venezuela** - Website of the National Institute of Statistics: <http://www.ine.gov.ve/>

Pages of multilateral and cooperation organizations

- Website of the United Nations Department of Statistics (SEEA-UNSD) on the Environmental Economic Accounting System: <https://seea.un.org/>
- Website of the review process of the Environmental Economic Accounting System - Experimental Ecosystem Accounting (SEEA-EEA) - of the United Nations Department of Statistics:
<https://seea.un.org/content/seea-experimental-ecosystem-accounting-revision>

- Website of the Environmental Economic Accounting System - Ecosystem Accounts (SEEA-CE) - of the United Nations Department of Statistics: <https://seea.un.org/ecosystem-accounting>
- Knowledge platform on Environmental Accounting of the United Nations Department of Statistics: <https://seea.un.org/content/knowledge-base>
- Website of the United Nations Department of Statistics e-Learning resource on Environmental Accounting: <https://elearning-cms.unstats.un.org/course/category/1>
- Website of the Latin American Community of Natural Capital Accounting (COMLAC): <https://comlac.website/>
- Website of the Virtual Portal of Statistics and Indicators (ECLACSTAT) of the Economic Commission for Latin America and the Caribbean (ECLAC): https://estadisticas.cepal.org/cepalstat/WEB_CEPALSTAT/estadisticasIndicadores.asp
- Website of the ECLAC Statistical Yearbook for Latin America and the Caribbean: <https://www.cepal.org/es/publicaciones/ae>
- Website of the ECLAC Regional Environmental Statistics Network: <https://comunidades.cepal.org/estadisticas-ambientales/es>
- Website of the ECLAC Environmental Statistics: <https://www.cepal.org/es/temas/estadisticas-ambientales>
- Website of the ECLAC Library - Environmental and Climate Change Statistics for Latin America and the Caribbean: <https://biblioguias.cepal.org/estadisticasambientales/>
- Website of the Sustainable Development Solutions Network (SDSN) - Indicators and Monitoring Framework: <https://indicators.report/overview/>
- Website of the Thematic Research Network on Data and Statistics (TReNDS - Thematic Research Network on Data and Statistics): <https://www.sdsntrends.org/>
- Website of the SDG Academy: <https://sdgacademy.org/>
- Website of the Eurostat on Ecosystem Accounts: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Ecosystem_accounts_-_measuring_the_contribution_of_nature_to_the_economy_and_human_wellbeing&oldid=480513

Attachment 3. Initiatives

Initiatives, programs and projects related to the implementation of EEA in the LAC region				
Name	Duration	Description	Countries	Institutions
Strengthening of statistical capacities for construction of macroeconomic indicators and sustainable development in Latin American, Caribbean and Asian Pacific countries (Carvajal, 2017)	Concluded in 2017	Training in the implementation of the SEEA in several countries in the region	Countries with Implementation in LAC: Brazil, Colombia, Curacao, Jamaica, Paraguay, Uruguay and Dominican Republic -Various countries in the region that benefited from the activities of this project, such as regional workshops	ECLAC
Advancing with Natural Capital Accounting (ANCA)	2014 to 2016	Test the implementation of the SEEA-EEA in different countries	Countries with Implementation in LAC: Chile, Mexico	UNSD, UNEP, CBD, ECLAC
Natural Capital Accounting and Valuation of Ecosystem Services (NCAVES)	2016 to 2020	Contribute to the theory and practice of environmental and ecosystem accounting	Countries with Implementation in LAC: Brazil, Mexico	UNSD, UNEP, CBD
Wealth Accounting and Ecosystem Services Assessment (WAVES) [integrated into the Global Program on Sustainability (GPS)]	Since 2010.	Promote sustainable development, ensuring that natural resources are integrated into development planning and the SNA	Countries with Implementation in LAC: Guatemala, Costa Rica and Colombia. Support for Uruguay is planned. -Various countries in the region benefiting from the different activities of this project, such as regional workshops.	World Bank
Preparation of Environmental economic water accounts (regionalized) in Peru (Carvajal, 2017)	In force	Training and financing in different areas of environmental accounting	Peru	IDB
Ecosystem Values and Accounting	Concluded in 2016	Experimental ecosystem accounting	Peru and Bolivia	CI

Initiatives, programs and projects related to the implementation of EEA in the LAC region				
Name	Duration	Description	Countries	Institutions
(EVA) (Carvajal, 2017)		in Peru.Support in the study of EEAs in Bolivia.		
TEEB Regional-Local Project : Conservation of Biodiversity through the Integration of Ecosystem Services (ESs) in Public Policies and Business Activities	2012 - 2019	Support public and business actors in considering the economic and non-economic value of biodiversity and ESs in their decision-making processes [with an EEA support component]	Brazil	MMA (Brazil), GIZ, CNI, IBGE
EnhaNCA: Enhance Natural Capital Accounting Policy Uptake and Relevance	2019	Provide materials to increase policymakers' understanding of the applications of natural capital accounting under the System of Environmental Economic Accounting (SEEA)	Global	UNSD
Environmental policy - approaches to transformative change	2018 - 2021	Promote environmental protection and nature conservation in international cooperation for development, through the provision of specialized consultancy and the development and implementation of transformative policy approaches.	Global	BMZ
BIOFIN - Finance for Biodiversity	2012 - 2022	Develop biodiversity financing	Belize, Brazil, Chile, Colombia, Costa Rica, Ecuador, Guatemala, Mexico, Peru, Cuba	UNDP
Latin American and Caribbean Initiative for Sustainable Development (ILAC)	in force	Create indicators for Sustainable Development in the region and promote their development	Regional	UNEP (secretariat)
Partnership for Action on Green Economy (PAGE)	in force	Help countries transform their economies to eradicate poverty, increase jobs and social equality, strengthen livelihoods and environmental management and sustain growth in line with the SDGs, the Paris	Countries with Implementation in LAC: Argentina, Barbados, Brazil, Guatemala, Guyana, Peru, Uruguay	UNEP, UNDP, UNITAR, ILO, UNIDO

Initiatives, programs and projects related to the implementation of EEA in the LAC region				
Name	Duration	Description	Countries	Institutions
		Agreement and the Post-2020 Biodiversity Goals.		