DEPARTMENT OF ECONOMIC AND SOCIAL AFFAIRS
STATISTICS DIVISION
UNITED NATIONS

System of Environmental Economic Accounting

# Implementation strategy for the SEEA Ecosystem Accounting

# DRAFT[1]

Version: 11 June 2021

[1] This paper is an initial draft of the implementation strategy that has been prepared by UNSD for discussion at the UNCEEA. It has benefitted from comments from the SEEA Technical Committee and the Bureau of the UNCEEA. A revised paper will be revised and circulated to the UNCEEA for review and comments before its submission to the UN Statistical Commission.

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# 1 Introduction

The United Nations Statistical Commission (UNSC) adopted the SEEA Ecosystem Accounting (SEEA EA)[2] at its 52nd session in March 2021. The SEEA EA chapters 1-7 describe the accounting framework and the physical accounts and were adopted as an international statistical standard, while chapters 8-11 represent internationally recognized statistical principles and recommendations for the valuation of ecosystem services and assets, and chapters 12-14 describe applications and extensions to the SEEA EA. The Commission also encouraged the implementation of SEEA EA in countries and requested the UN Committee of Experts on Environmental Economic Accounting to develop an implementation strategy which takes into account country priorities and data availability.

The adoption of the SEEA EA has received a lot of interest and attention not only within the statistical community but from policy and decision makers. The UN Secretary General, Antonio Guterres called the adoption an "historical step towards transforming the way how we view and value nature". The Executive Secretary of UN Environment, Inger Andersen called the SEEA as a "game-changer in decision making". The Executive Vice Present of the European Commission Frans Timmermanns said that the SEEA EA "moves beyond GDP and takes better account of biodiversity and ecosystem in national economic planning. It is a major development in changing the way we think about prosperity and well being". Such high-level endorsement requires that the implementation of SEEA EA is suitably ambitious while at the same time manages expectations about the rate at which progress can be made.

**Benefit of an accounting approach**

Using an accounting approach to derive the indicators allows harmonization of environmental data from multiple sources and brings coherence and consistency across disparate statistics. It also establishes a centralized system for organizing information on the environment and the economy, thereby reducing the possibilities for repetition of data collecting activities across different government agencies and can help streamline reporting across multiple national reporting commitments. In addition, it ensures that information can be compared with confidence across time. Further, by organizing information from different agencies and sectors in a consistent manner, the SEEA opens up dialogue across these agencies and sectors and enables trade-offs and synergies related to environmental management decisions to be more readily revealed.

The SEEA EA is grounded in the set of concepts and classifications that is coherent with the System of National Accounts and that can be aligned with the social statistics routinely compiled by national statistical offices. As such, the SEEA EA also provides a mechanism to mainstreaming environmental information into economic and national development planning. It is compatible with the Balance of Payments and International Investment Position framework, the International Standard Industrial Classification of All Economic Activities, the Central Product Classification system, and the Framework for the Development of Environment Statistics. This also opens up pathways to implement a range of integrated economic–environmental modelling approaches.

[2] See https://seea.un.org/ecosystem-accounting

The broad consistency that the SEEA brings to organizing environmental information is clearly essential to delivering a planning approach that considers all the social, economic and environmental dimensions to sustainable development in an integrated way. As such, it is a powerful tool for multiple line ministries, especially those concerned with sustainable national development and delivering better outcomes for the environment and society.

This paper presents the first draft implementation strategy. After review and discussion in various fora, including the Technical Committee on the SEEA EA and the UNCEEA, it will be presented to the UN Statistical Commission in March 2022. The purpose of this Strategy is to set targets for implementation that could support wider high-level engagement and identify actions at the global level that can support the implementation in countries. The implementation strategy takes a flexible and modular approach which considers policy priorities, data availability and institutional framework and covers implementation at different scales, at national as well subnational level. The Strategy provides a general direction of the steps to be undertaken in setting up an implementation and mainstreaming programme at national level. It also identifies existing global initiatives and possible entry points to advance and promote SEEA EA implementation.

The audience of the implementation strategy can be broken into two main groups. The first group includes data producers at the management level that require an understanding of the resources needed for SEEA implementation, not only from national statistical offices but also from other agencies. The second group includes those involved in policy planning and decision making in ministry of finance, planning, environment and other policy agencies. It is very important to bring together users and producers of statistics from the outset of any implementation project or programme. The data users must be key partners from the outset, to understand the need and potential for such accounts to support policy and decision making, to help set priorities and to ensure proper resources are allocated for SEEA implementation.

This paper outlines the proposed implementation strategy. Section 2 provides the context of the implementation, including the demand for the SEEA EA, the data situation and advantages and opportunities to compile SEEA EA. Section 3 presents the objectives of the strategy and the approach and main principles. Sections 4 present activities to support the SEEA EA implementation. Section 5 presents the monitoring of the strategy. Section 6 a possible governance to oversee the implementation strategy and Section 7 discusses the need for resource mobilization. Section 8 includes questions to the UNCEEA.

# 2 Context for the implementation strategy

Ecosystem accounting is undergoing rapid growth and development, and accounts have already been used to inform policy development around the world. From a zero base in 2013, according to the Global Assessment of Environmental Economic Accounting and Supporting Statistics, 34 countries have implemented ecosystem accounts in 2020 with additional 13 countries indicating plans for SEEA EA

implementation.[3] Although it is a significant achievement, it falls short of the target of 50 countries implementing ecosystem accounts by 2020 set by the UNSC at its 44th session in 2013.

The United Kingdom and the Netherlands have published the most comprehensive accounts to date. Both countries' accounts include detailed maps and physical and monetary accounting tables with consistent applications of concepts and methods. In many other countries, progress is being made towards comprehensive SEEA EA accounts. Australia has published two national and several sub-national accounts. Other countries with published accounts include Canada, Costa Rica, Colombia, Indonesia, Italy, Norway, Mexico, Netherlands, the Philippines, Rwanda, Spain and Uganda. Supranational accounts have been developed for the European Union.

## 2.1 Policy demands for the SEEA EA

There is an increasing demand for integrated information to support integrated policies. It is widely recognized that economic growth as measured by GDP is no longer sufficient to inform the challenges of today and the need to go "beyond GDP" to better support policies that are greener, more inclusive and more equitable, is widely accepted. The SEEA EA, given its systems-based approach can support these policy questions at the heart of the sustainability, including biodiversity and climate agendas. Examples of its application in policy are emerging with its growing uptake. The SEEA enables countries to develop an integrated statistical framework from which to derive indicators to support national policies and monitoring and reporting of many initiatives including the Sustainable Development Agenda, the Post-2020 Global Biodiversity Framework, the climate change and land degradation agendas.

The SEEA as an integrated framework for organizing information on the economy and the environment makes it an ideal framework to assist countries in reporting on a number of **SDG** indicators, in particular those related to the economy and the environment. According to an analysis carried out by the UNCEEA, the SEEA supports monitoring of 40 SDG indicators for nine Sustainable Development Goals.

Data from the SEEA EA accounts can also be used to inform a wide range of **climate change** related policy questions in particular, climate impacts and adaptation strategies. They can also help with mitigation strategies, for example to understand impacts of emissions into air, water and waste on ecosystems as well as to support nature-based solutions.

The development of the Post-2020 Global Biodiversity Framework and its associated monitoring framework present an excellent opportunity to ensure that the SEEA is considered as the underlying framework for those indicators that measure the interaction between economic activities and **biodiversity** identifying drivers of biodiversity loss and ecosystem degradation, responses by society in terms of expenditures or other economic instruments and impacts of economic and human activities. The UNCEEA and the SEEA are recognized in the official documentation[4] of the CBD Subsidiary Body on Scientific Technical and Technological Advice (SBBSTA) on the monitoring framework. In the same

[3] From the Global Assessment of Environmental-Economic Accounting and Supporting Statistics 2020: https://unstats.un.org/unsd/statcom/52nd-session/documents/BG-3f-2020_GA_report_%20draft_%20ver7_nomap-E.pdf

[4] https://www.cbd.int/doc/c/9849/459f/b9fe0e74c9e1f25dd90dee23/sbstta-24-l-03-en.pdf

document, SBSSTA calls for the creation of an expert group that supports the development and implementation of the indicators with the participation of the statistical community. The group on indicators that was established during the SEEA EA revision process has already provided considerable input in the development of the indicators.

The importance of a measurement framework to measure the contribution of nature to the economy and livelihoods supporting policy and decisions that take into account biodiversity and ecosystems is recognized in the IUCN resolution "Accounting for biodiversity: encompassing ecosystems, species and genetic diversity" (WCC-2020-Res-057-EN),[5] which was adopted by IUCN Members Assembly in the virtual lead up to the IUCN World Congress 2021. The resolution calls for IUCN members, partners, especially national governments to implement the SEEA and for the mobilization of resources to (a) support the development and implementation of the SEEA to describe accounting for biodiversity at ecosystem, species and genetic levels; (b) support the derivation of indicators of biodiversity change and the production and organization of biodiversity and ecosystem services data; (c) support the national statistical offices, in implementing the SEEA; and implementation and application of SEEA accounting for biodiversity in all relevant aspects of their work.

## 2.2 Data situation

One of the distinguishing characteristics of ecosystem accounting is that it is spatially explicit and it is generated by combining multiple layers of information (environmental, ecological, and economic) which can be displayed on maps or summarized into accounts and tables.

There are several challenges when compiling ecosystem accounts. First, the data needed are not typically collected by statistical offices which usually rely on, surveys, administrative data, censuses and the like. Second, data is usually collected by many ministries and agencies that use it for monitoring rather than statistical purposes and thus often are collected irregularly, using definitions and classifications not consistent with the standard definitions and classifications and with limited use of statistical principles. Third, on the demand side, policy agencies are often not familiar with how to use the information generated from the accounts. Fourth, data are often generated from big data/earth observation and with the use of biophysical modelling, which often is undertaken outside national statistical offices.

**NSOs as data stewards**

The data context described in the previous section calls for a transformation of the regular operations of a national statistical office, which is increasingly required to use new technologies and branch out areas of expertise beyond its usual competence. As a consequence, the NSOs needs to embrace the role of data steward and increasingly rely on the expertise from other ministries, academia and the private sector, including using big data and models to compile the accounts. As data stewards, NSOs will shift from being solely producers of statistics, to also becoming service providers, whereby NSOs facilitate a collaborative approach to data and statistics across different data and statistics communities and provide appropriate oversight and governance.

[5] https://portals.iucn.org/library/sites/library/files/resrecfiles/WCC_2020_RES_057_EN.pdf

Arguably, no other statistical domain demonstrates the potential role of NSOs as data stewards more than the ecosystem accounting. The implementation of the SEEA EA is often led by the official statistics community and NSOs, but given the highly cross-cutting and spatial nature of ecosystem accounting, implementation necessitates a highly collaborative approach. Implementation will require the active participation of representatives of many different agencies and disciplines, including ministries of environment, planning, finance, and national agencies for the protection of environment, water management, cartography, academia, etc. which need to be brought together each contributing to particular aspects of the compilation of ecosystem accounting.

**Projects and initiatives that support the SEEA implementation**

There is a number of initiatives and projects that have been established in the past few years and emerging ones that have been particularly key for advancing the development and implementation of the SEEA EA. It is important to list them in the implementation strategy and identify synergies to ensure close coordination and collaboration in order to avoid duplication of work, especially at country level.

# 3 Strategy for the implementation of the SEEA EA

The implementation strategy can be organized according to the theory of change logic, providing a comprehensive description of how to achieve the overall objective of the implementation strategy that is to scale up the uptake of the SEEA EA in countries following up on its adoption by the UN Statistical Commission. Figure 1 below outlines the steps to achieve the overall objective in terms of specific objectives, outputs, activities, inputs and identifying the needs and opportunities. Key performance indicators can be designed to measure the success of the outputs and the achievement of the target.

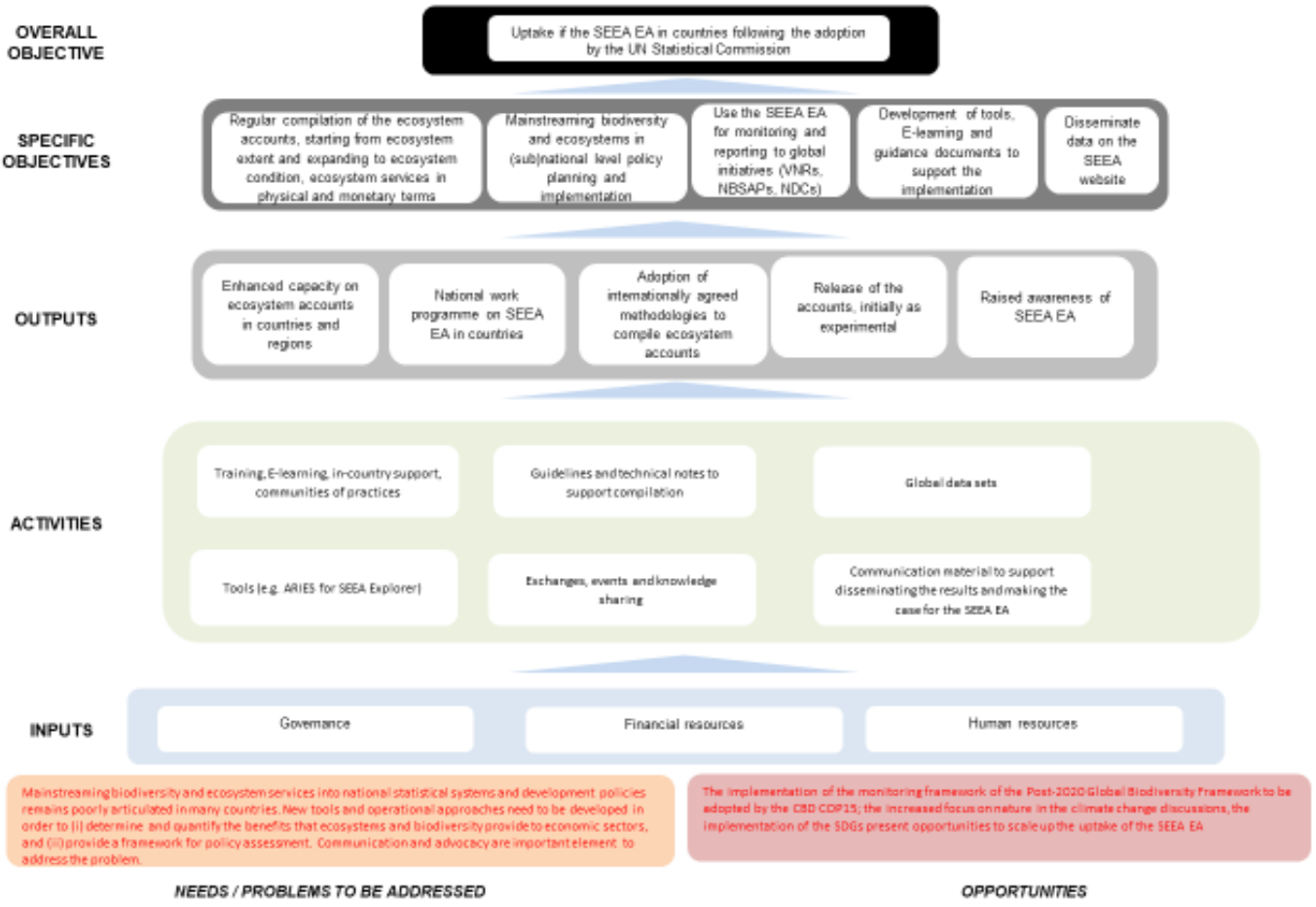
## 3.1 Objectives for the implementation

The **overall objective of the strategy is to scale up the uptake of the SEEA Ecosystem Accounting**. A suggested target of the overall objective is that **at least 60 countries implement at least one account of the SEEA EA by 2025** as defined in the Global Assessment of the SEEA and supporting statistics.

To achieve the above overall objective, a number of specific objectives need to be achieved. These include:

- Regular production of selected ecosystem accounts, starting from ecosystem extent accounts to ecosystem condition and ecosystem services in physical and monetary terms;
- Mainstreaming biodiversity and ecosystems into (sub)national policies;
- Use of the SEEA EA for monitoring and reporting in particular in National Biodiversity Strategies and Action Plans (NBSAPs), the Voluntary National Reports that present country progress towards achieving the SDGs, and the National Determined Contributions (NDCs) that present country progress towards climate targets and highlight the government actions and policies to combat climate change
- Dissemination of ecosystem accounts through global data sets

Figure 1. – Implementation strategy




## 3.2 Approach and main principles

**Multi stakeholder engagement**

The multi-disciplinary nature of the ecosystem accounts as well as the challenge inherent in working with spatial data and novel measurement techniques requires a collaborative approach which takes advantages of the strengths of NSOs in combination with the expertise of other agencies and research organisations. Moreover, the engagement with users of the accounts is important to be undertaken at the outset.

Key stakeholders in the implementation of the SEEA EA include:

- Environmental economic accountants that have expertise in applying accounting concepts to environmental and ecological data
- Scientists that have in depth knowledge of the functioning of ecosystems and their measurement and assessment (e,g, experts in ministries of Environment and other line ministries, IUCN, CI, CSIRO, Bird life, etc.)

- Environmental economists that have expertise in the concepts and use of valuation techniques to value ecosystem services and assets
- Geospatial experts that have knowledge of the earth observation data and spatial infrastructure (e.g. ESA, NASA, EO4EA, GEOBON, EO4SDG, national geospatial agencies)
- Users of the accounts (e.g. finance and planning ministries, ministries of the environment, private sector, etc.)

Coordination and communication at the international level involves collaboration with key stakeholders such as the CBD Secretariat, IPBES, IUCN, CI, GGKP, UNFCCC, UNCCD, etc.

**Flexible and modular approach**

A key element of the proposed SEEA EA implementation strategy is to allow for a flexible and modular approach. This entails that rather than proposing a 'one size fits all approach,' it takes as its point of departure the recognition that countries differ in terms of their specific policy issues and their level of statistical development. The SEEA EA is a system conceived as an integrated, internally consistent series of accounts. At the same time, its design is such that it can be implemented equally well in part or as a whole, i.e., the implementation can be flexible and modular.

Depending on the specific environmental and economic context, a country may choose to implement only a selection of the accounts or to compile accounts for selected regions within the country. Particularly relating to the compilation of accounts in monetary terms, some compilers may be concerned that the data requirements and methodological assumptions are too significant to justify their compilation as part of official statistics. At the same time, there may be substantive demand for well-defined and comparable estimates in monetary terms for use in policy and analysis. Therefore, in the short term, the compilation of experimental accounts may be an important step to support capacity development and engagement with users.

**Tiered implementation**

Considering the novelty of the implementation of ecosystem accounts and often lack of data at the national level, a tiered implementation is recommended starting first from global data sets and improving on them using national data where available. It is important to note that while the SEEA EA has been adopted, the results of the accounts are often released as experimental or pilot to indicate that further refinement of the data and methodology needs to take place. Many countries have adopted this approach and have released accounts on an experimental basis with the objective to mainstream them into the statistical production process and in due course elevate them to the level of official statistics. It is encouraged that countries release their results with the proper flagging as their experience can provide further input in advancing the methodology and generate interest and possibly resources at the national level to improve on the basic data.

**(Sub)regional approach**

To aid countries in implementing the SEEA EA, a regional or sub-regional approach is being taken. The UN Regional Commissions as well as multilateral development banks and other bodies have an important role to play to advance the implementation in countries by providing opportunities for countries to share their experiences, supporting regional community of practices, leading capacity building activities, raising awareness on the SEEA EA within national statistical offices and users of the

accounts, supporting in country implementation and facilitating south-south collaboration. In this context it is particularly important that the Regional Commissions and multilateral Development Banks include environmental economic accounts at the core of their work programmes and establish regional groups with a clear mandate and work programme under the auspices of their committees (i.e. Statistical Conference of Americas, Conference of European Statisticians, Committee on Statistics in Asia, Statistical Commission for Africa and the Statistical Committee in ESCWA). Sub-regional bodies can also support the implementation as they often have been established to support trade and regional integration and as such, foster close collaboration among countries of the subregion. Increasingly issues such as the management of common environmental resources and addressing common problems such as climate change have also come to the forefront in the agenda of sub-regional groups. From a statistical point of view, regional and sub-regional organizations have played important roles in bringing together countries, compiling existing statistics, promoting standards and developing capacity in countries and fostering south-south cooperation.

**South-south cooperation**

Within each region or sub-region, it is intended that one or more countries will be selected as lead countries. Lead countries will not only have begun to implement the accounts in earnest, but also are expected to be leaders and advocates for ecosystem accounts, share technical knowledge with other countries in the region or sub-region that are interested in implementing the accounts, and foster south-south cooperation.

Process of implementation of the SEEA EA at the country level

The process for the implementation of the SEEA EA at the country level can be broken down into 4 phases 1. Strategic planning; 2. Building mechanisms for implementation; 3. Compiling and disseminating accounts; 4. Institutionalization (strengthening national statistical systems). Annex I explains the phases in detail

# 4 Activities in support of the implementation - key elements and activities

## 4.1 Capacity building

Capacity building is one of the key elements of the implementation strategy. Capacity building programmes include **training and E-learnings and in-country support**. The Global Assessment of the SEEA EA has indicated that all countries compiling the SEEA EA have received some sort of in-country technical assistance provided either by international agencies or more advanced countries. Countries that have experience in implementing the SEEA EA should support within their capacity the implementation in countries through providing training and in-country support.

SEEA EA is a new area of statistics and its implementation requires skills and expertise that go beyond the regular activities of a national statistical office. Establishing a common language among experts from different disciplines requires great efforts. In addition, working using different data sources such as geospatial information and big data in addition to surveys and administrative data requires extensive training. Further understanding the accounting framework of the SEEA EA requires training on the

accounting concepts and principles. The training and capacity building programme should aim at audiences from different disciplines beyond national statistical offices.

The training programs will be implemented through both online and in-person activities, including training seminars, workshops and meetings. Several e-learning training resources are already available, especially in the form of self-paced modules and webinars. In addition, a number of in-person workshops have been conducted.[6] However, the current training material has been based on the SEEA 2012 EEA and the Technical Recommendations from 2017 and is hence outdated. The training materials are being updated to reflect the latest SEEA EA concepts and definitions. The objective would be to translate the training material into several languages, such as French, Spanish and Russian for example, to make it more accessible to certain countries and to roll out a programme of regional trainings across the globe.

Actively pursuing training and capacity building initiatives at a (sub-)regional level should enable regional organizations and their member countries to share experiences (peer-to-peer) in developing sustainable environmental-economic accounting programs. Regional communities of practice have proven to be a very valuable resource for NCA practitioners at the regional level form both statistical and policy communities.

For example, the Africa Natural Capital Accounting Community of Practice[7] is a regional learning and knowledge platform that brings together professionals from governments institutions, nongovernmental organizations and academia that are interested in or working on NCA in Africa. It was initiated in November 2019, following the first Africa Forum on Natural Capital Accounting in Kampala, Uganda. Similar, but a less formal, community of practice is also functional in the Latin American and the Caribbean region,[8] and interest in other regions has also been expressed.

## 4.2 Development of guidelines and material to support compilation

While the SEEA EA has been adopted, further methodological development is needed in particular concerning the compilation of the concepts outlined in the SEEA EA. In particular, it is important to set priorities with regard to the implementation agenda for example concerning the choice of ecosystem services and agree on a common method to measure it. The methodological guidelines that are currently being developed, as part of the EU funded project NCAVES, to support the implementation include the (1) Guidelines for biophysical modelling for ecosystem accounting; and the (2) Guidelines on the valuation of ecosystem services and ecosystem assets. The Guidelines for biophysical modelling are specifically designed for statistical agencies interested in compiling ecosystem accounts. They provide an overview of biophysical modelling techniques and the main modelling platforms and tools available, as well as an overview of available global data sets. They also contain chapters on modelling terrestrial ecosystem extent, condition and ecosystem services.

[6] All UNSD training resources are presented on the SEEA website: https://seea.un.org/content/seea-e-learning-resources.
[7] https://seea.un.org/content/africa-community-practice
[8] http://comlac.website/

The Guidelines on the valuation of ecosystem services and ecosystem assets are intended to provide practical guidance on the most common valuation methods. They will also discuss, for each ecosystem service, the methods best suited for valuation in an accounting context and provide practical examples to illustrate how to apply the valuation methods. The guidelines will also cover methods for the valuation of assets, including discount rates, estimating future values and price changes. The Guidelines on scenario analysis focus on describing what types of analyses are possible when using the revised SEEA EA and what types of policy questions can be answered when using the accounts in modelling exercises. The Guidelines also provide an overview of the different types of models that are being used in scenario analysis. The intended audience of these guidelines goes beyond the statistical community and will include model developers and policymakers.

Using the above guidelines as a starting point for testing and experimentation, the objective of area B2 on Advancing methodology for the SEEA EA is to move towards agreed methodology for measuring selected ecosystem services in physical and monetary terms as well as indicators for measuring condition for selected ecosystem types.

## 4.3 Strengthening collaboration

Coordinating activities at the global level is at the heart of the implementation strategy as it will allow to leverage expertise and resources from all involved in advancing the measurement and policy agenda on ecosystems and biodiversity. Coordination is a cross cutting activity that should be undertaken in all areas of work of the committee including development of methodology, capacity building and data and therefore being undertaken by the existing groups established under the auspices of the UNCEEA, namely the groups on methodological development, data and capacity building. One of the primary issue of coordination is identifying and prioritizing those activities and initiatives that call for timely and quality data on ecosystems and biodiversity and develop an engagement strategy. By way of example, as indicated in Section 2, the SEEA EA is well positioned in the discussions on the development of the monitoring framework of the Post-2020 biodiversity framework. However, new initiatives are starting for example in the context of the UN Decade for ecosystem restoration initiative which will develop a set of indicators to monitor progress towards ecosystem restoration, and it is important to coordinate activities to avoid duplication.

International workshops and Fora such as the Expert Forum on SEEA Ecosystem Accounting and the Forum and the Policy Forum on Natural Capital Accounting for Better Decision Making which take place yearly provide an opportunity to discuss on-going initiatives and better coordinate their development and implementation.

Coordination at the country level is also very important to ensure a coordinated approach to implementation and an efficient use of resources. Often times different agencies are working with similar objectives in countries. It is important that a coordination mechanism is established at the country level through the National Steering Committee. In addition, the UNCEEA has established SEEA focal points in countries. The focal points have broad knowledge of the SEEA and are responsible for designing and driving forward the strategy for SEEA implementation and mainstreaming of its use interacting with stakeholders. The focal points serve as a first point of contact to address requests and questions related to the SEEA, distributing them to the relevant people in the country and ensure

follow-up. A country may nominate one or more focal points from the national statistical office or other ministry. Depending on the country context, it may be the case that one focal point is from the national statistical office or agency responsible for the accounts, and other from different agencies. While the SEEA focal points are technical experts, they should work in close collaboration with senior management of their institutions to be able to further the national implementation and coordination of activities.

## 4.4 Data and tools

The compilation of global datasets for ecosystem accounts is important to ensure that the SEEA EA is taken up in global reporting such as the National Biodiversity and Action Plans as well as reporting for the SDGs, climate change and desertification agreements. The spatially explicit nature of the accounts allows to compile selected accounts using earth observation global data sets. In many instances, a first tier of ecosystem accounts could be developed using purely global data and basic modelling approaches. Such accounts can then be improved and updated, in the second tier, by using national and local datasets and ground truthing together with more sophisticated and locally applicable biophysical models resulting in both improved data for existing models and better, locally specific, models using better and additional data. To allow for such tiered approach, interoperability of the data and tools is very important.

**Tools**

ARIES for SEEA Explorer has been developed with the objective of compiling Tier 1 ecosystem accounts for ecosystem extent, selected ecosystem services and ecosystem condition for selected ecosystem assets. ARIES as a tool itself, over a decade in development, has long supported modelling approaches by building a *semantic web*[9] of data and spatial models that achieve high-level *semantic interoperability* (which enables a receiving system to properly understand the meaning of data that are exchanged, reusing it in an appropriate manner, as opposed to lower-level *syntactic interoperability*, which relies on the use of compatible data formats and communication protocols). ARIES makes a large and growing collection of data and models easily accessible to users with limited experience in spatial modelling, including NSOs, and can also facilitate reporting on key global initiatives such as the Sustainable Development Goals, Post-2020 Global Biodiversity Framework, Paris Climate Agreement. The objective is to gradually expand the coverage of ecosystem services and ecosystem condition measures as new data layers become available and can be integrated in the technology. Also, an interface which will allow the users to insert national data is being developed.

There are, however, many different tools and datasets that exist and can support the compilation of SEEA EA accounts, among others, EnSym, ESTIMAP, InVEST, iTree, LUCI, SWAT, just to name a few. The aim is to move toward ambitious yet achievable goals for interoperability in the SEEA community, and align the responsibilities of various stakeholders working in the geospatial modelling community to achieve global use of SEEA (e.g., data providers, modelers, platform hosts).

At the heart of ARIES for SEEA and the different tools mentioned above is the interoperability of data and models. A long-term shared vision is that (1) all key data and models needed to compile SEEA

[9] A "web of data" interlinked so that both people and computers could traverse across databases over the network

accounts and related global indicators (e.g., SDGs, post-2020 Biodiversity Goals) are interoperable, while (2) researchers independently use principles of interoperability when developing new data and models, making them seamlessly ingestible by interoperability-cantered modelling approaches. Nations with limited data and technical capacity can benefit strongly from an interoperability-focused approach, by gaining access to context-appropriate data and models that can be properly assembled by computers.

It also useful to caution that interoperable, but lower quality global remote sensing data, may be very useful but not a sufficient long-term solution. At the same time, it is possible that an interoperable system that countries can progressively adapt their data to is a sensible approach, but the steps towards that and the rationale for the additional costs need to be clearly articulated, in particular related to the fitness for purpose question underpinning this discussion.

A number of global data sets and models that have been developed by space agencies, academia or NGOs are candidate for use in the compilation of SEEA EA. A list of these data sets is being compiled in the context of an effort led by the EO4EA, a GEO initiative to support the SEEA EA and discussions are underway with a number of partners to make some of these datasets interoperable.

## 4.5 Communication and advocacy

As an integral component of the implementation strategy, advocacy aims to support an ongoing dialogue among statistical producers, the various levels of government, business sector, the academic community, and the general public about user needs for official statistics and the progress in meeting those needs. This recurrent communication can be established through targeted workshops, conferences, press releases and promotional materials that highlight the benefits of good quality official statistics in general, and SEEA EA accounts in particular. These regular engagements between the producers of statistical outputs and the providers of basic data on one hand and the users of the accounts on the other will reinforce a better funded and more effective SEEA EA programme that provides reliable data for an evidence-based economic policy formulation. The focus of the advocacy should be on stimulating demand and engaging with users.

The advocacy is very relevant in light of the international initiatives mentioned in Section 2 above. The aim is for natural capital accounting, and the SEEA EA, to support the international efforts in monitoring the global indicator frameworks. Advocacy and communication efforts will need to be made to ensure the SEEA EA is used as the underlying international statistical standard to support these monitoring initiatives.

Several materials are available to increase policymakers' understanding of applications of natural capital accounting (NCA) according to the SEEA EA and encourage its uptake for policymaking. Among others, the publications developed under the Enhance Natural Capital Accounting Policy Uptake and Relevance (EnhaNCA) project, are aimed for a broad, non-technical audience, including government ministries and central banks and cover NCA's contribution to integrated: (1) policies for sustainability; (2) biodiversity policies; (3) climate change policies; and (4) sustainable macroeconomic strategies.[10] Other events, such

[10] https://seea.un.org/content/enhanca-enhance-natural-capital-accounting-policy-uptake-and-relevance

as the Forum on Natural Capital Accounting for Better Policy, are also supporting the advocacy and uptake of NCA in policy making.

Related to the requirement of multi-stakeholder coordination for the implementation of SEEA EA and the tendency for NSOs to become data stewards, national level coordination among ministries and agencies is becoming more prominent. There may also be need to develop more guidance materials to assist national statistical offices with national level coordination and governance, as well as compile best practices how have such coordination mechanisms been put in place in other countries. A communication strategy was developed by the UNCEEA and may be reviewed and updated to reflect the current demands and visibility of the SEEA EA.

# 5 Monitoring the implementation [ Needs further work]

The monitoring of the implementation of the SEEA EA has been undertaken through the Global Assessment of Environmental Economic Accounting and Supporting Statistics. The aim of the Global Assessment is to assess the progress made in implementation of the SEEA, Central Framework and Ecosystem Accounting. The number of countries implementing the SEEA informs Sustainable Development Goal (SDG) target 15.9 on integrating ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts. In particular, the number of countries implementing the SEEA provides data for indicator 15.9.1. In addition, the Global Assessment informs progress towards the targets of the SEEA implementation strategy.

The 2020 Global Assessment of Environmental-Economic Accounting was first implemented in 2006 and then has been implemented every three years starting since 2014. From 2021, the intent is to conduct the Global Assessment on annual basis to inform the progress towards the implementation of SDG indicators 15.9.1 and provide a useful tool to track implementation of the SEEA EA.

The Global Assessment could be reviewed to also include appropriate key performance indicators to monitor the strategy, these could include number of people trained, amount of financial and human resources provided by donors or national funding, number of indicators derived from the SEEA used for reporting, etc.

# 6 Governance mechanism

In the multi-stakeholder environment for the SEEA EA implementation strategy, a mechanism is needed in order to coordinate, monitor and report progress at (sub) regional and international level. The purpose of this mechanism would be to share information on the development and the execution of the SEEA EA implementation strategy.

The implementation of the SEEA EA is a cross cutting issue involving all groups operating under the Bureau of the UNCEEA. The Technical Committee on the SEEA EA ( Area B2) composed of experts from NSOs, International Organizations, NGOs and academia has the know how to review the technical materials supporting the implementation, Area D on capacity building is responsible running the global assessment and developing an implementation programme at the sub(regional) level; Area C is involved in data and Area A is responsible for establishing collaboration among different stakeholders and

identifying entry points for the use of the SEEA EA. [WHAT IS THE APPROPRIATE MECHANISM TO HAVE THE OVERSIGHT OF THE IMPLEMENTATION STRATEGY? THERE ARE ISSUES OF BUILDING AWARENESS AT THE HIGHEST LEVEL AND FUNDING WHICH GO BEYOND THE TECHNICAL RESPONSIBILITY]

To advance the methodology to support the implementation, it is proposed that the Technical Committee on the SEEA EA be supported by two Working Groups (WGs) composed of technical experts and led by a member of the Technical Committee. One on biophysical aspects, covering topics related to spatial units, ecosystem condition and modelling of ecosystem services, whereas the other on valuation and accounting treatments, covering topics related to monetary valuation of ecosystem services and assets, as well as topics related to complementary values. Each of the WGs will be composed of experts in the relevant fields and will aim to provide guidance in developing implementation materials, training courses, and advancing the research agenda.

Related to the events planned for the second half of 2021, namely the COP-15 on biodiversity and the COP-26 on climate change, there is a need for a dedicated working group on indicators to continue its work. This group started its work in 2020 supporting the revision and the drafting of Chapter 14. The group will continue its work to provide input into the global processes developing the monitoring frameworks, and may be extended to become a group on applications, including extended accounts, scenario modelling and communications. With the possible future expansion of the mandate, covering the SEEA Central Framework as well as Ecosystem Accounting, it may be relevant that the group on indicators report directly to the Bureau. The Bureau and the UNCEEA will be consulted in due course.

Furthermore, interest was expressed for continued work on some of the thematic areas, mainly biodiversity and oceans. The UNSC in March 2021 supported the plan for the development of SEEA Ocean, whereas a plan for SEEA for biodiversity has not been developed yet. These initiatives concern the development of a conceptual framework for ocean and biodiversity which consists of bringing together different accounts and possibly further developing relevant classifications. As such, these activities are not part of the implementation strategy per se.

# 7 Resourcing the strategy

Considering the interest that the adoption of the SEEA EA has generated and the policy demand, it is expected that the demand for technical assistance in compiling ecosystem accounts will increase at a rapid pace. It is therefore important to develop a fundraising strategy that will leverage on existing funding initiatives (e.g. European Union, multilateral development banks, national development agencies, Global Environment Facility, PARIS 21) as well as on existing resources and comparative advantages of all stakeholders and partners. It is suggested that a trust fund be established that would support the implementation of the SEEA EA in a coordinated fashion.

It is also expected that countries include funding needs for SEEA EA implementation in their national plans and actively seek additional sources of funding for their plans at the national level.

The limited resources should be focused on assisting countries that have shown commitment for SEEA activities by using their own initial funding to assist them in achieving some success, rather than being

used mostly for “seed” money where the chance of continued activity and ultimately national investment is limited.

In addition to the need for funding the strategy, consideration should also be given to the limited human resources that can support the country implementation. Considering the novelty of this area of statistics and the challenges posed by the multidimensional data and multi stakeholders involvement, countries need individual technical assistance. At the same time, the number of experts in this field of statistics is limited. A strategy to increase the number of experts in this field through train the trainers, develop south-south cooperation programme is urgent.

# 8 Questions to the UNCEEA

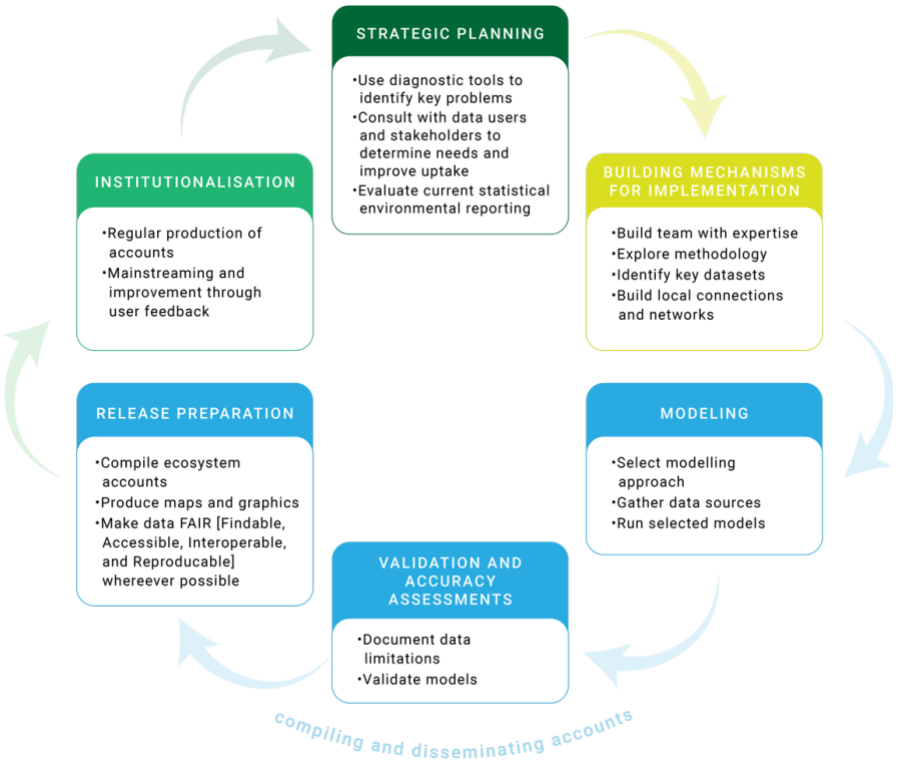
The UNCEEA may wish to express its views on:

1. Structure and content of the implementation strategy, including the scope of the strategy, which currently focuses on the SEEA EA but could easily apply to the SEEA CF as well
2. The use of the theory of change logic to organize the objectives, outputs and activities of the strategy
3. Governance and in particular the mechanism providing oversight of the strategy considering that it goes beyond the technical expertise of the various groups and involves aspects of resource mobilization.

# Annex Country implementation

The multi-disciplinary nature of the accounts as well as the challenge inherent in working with spatial data and novel measurement techniques requires a collaborative approach which takes advantages of the strengths of NSOs in combination with the expertise of other agencies and research organisations. Building on experience in countries and as outlined in the Guidelines on Biophysical Modelling for Ecosystem Accounting (United Nations, forthcoming). The implementation of ecosystem accounts at the country level can be broken into four phases: 1. Strategic planning; 2. Building mechanisms for implementation; 3. Compiling and disseminating accounts; 4. Institutionalization (strengthening national statistical systems). Figure 1 presents the process of implementation which is cyclical which each phases involving an in-depth evaluation and reassessment at the end of each reporting cycle. In addition to the four phases outlined above capacity building and communication are fundamental throughout the national implementation.

Figure 1. National implementation phases




*Source: Guidelines on Biophysical Modelling for Ecosystem Accounting (United Nations, forthcoming)*

**Phase 1 – Strategic planning**

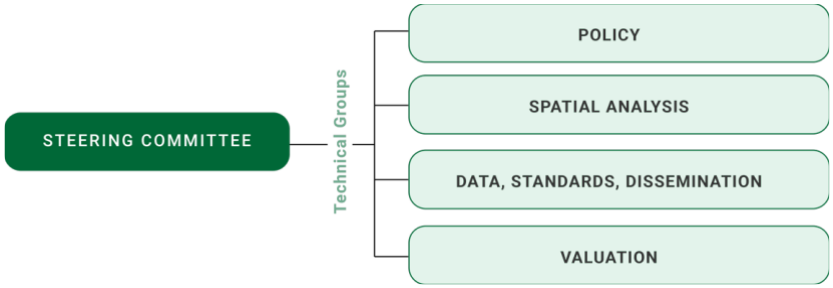
The initial phase of the project, which can be identified as a scoping phase, involves the creation of *national stakeholder group* and the development of an *assessment report* of policy and data needs. The stakeholder group usually relatively small will drive the implementation and should be composed of representatives from ministries beyond the national statistical office, including the ministry of environment and possibly line ministries that compile and use data on ecosystems and biodiversity, planning and finance ministries, that can use the accounts in their policy and planning, national mapping agencies that have experience on spatial data infrastructure and academia that uses and develops biophysical models as well as have expertise on valuing ecosystem services and assets.

The national assessment consists of a policy mapping, which will support the prioritization of the accounts to be compiled, the identification of key stakeholders and an assessment of data sources and national models to be used in the compilation of the accounts.

**Phase 2 -Building mechanisms for implementation**

The establishment of a coordination mechanism that has a clear mandate to advance the national implementation and mainstreaming into policy of the SEEA Ecosystem Accounting is key for institutionalizing the ecosystem accounting into official statistics. A proposed structure for such mechanism, which has been applied in several countries is presented in Figure 2.

Figure 2. General structure of a coordination mechanism for the implementation of the SEEA EA




*Source: Guidelines on Biophysical Modelling for Ecosystem Accounting (United Nations, forthcoming)*

The national Steering Committee is composed of a small group of senior members of the key agencies and provides direction to the production and use of the SEEA Ecosystem Accounts, sets priorities and develops and oversees the work programme. Several technical working groups can be established to focus on specific accounts (e.g. specific ecosystem services or measurement of condition for selected ecosystem assets) and is composed of experts from relevant ministries, academia.

**Phase 3 – Compiling and disseminating the accounts**

This phase consists in integrating the different data compiled from different data sources into the accounts. A number of challenges are usually encountered in this phase ranging from lack of data, to data compiled on a one-off basis and not collected according to standard classifications, to data not meeting the quality standards and to big data that result from biophysical modelling. It is important in this phase to take a pragmatic approach and compile the accounts with the available data and release them, possibly with an "experimental" label. The collaboration of experts from different disciplines is particularly important to ensure that the accounts are the results of the collective expertise of different experts. This phase is usually a learning phase from a compilation point of view as well as for demonstration of the policy relevance of the accounts. This phase should also be undertaken in a relatively short time frame to maintain the interest of the various stakeholders.

The dissemination of the accounts in ways that are relevant to users needs is also very important. Some users may need data at a relatively aggregated level whether others may be more interested in micro data for specific geographical areas. The active engagement with the stakeholders is key throughout the process of compilation of the accounts.

**Phase 4 – Institutionalization of SEEA EA**

Building on the experiences gained in the previous phases and in particular having identified the data gaps and challenges in implementation, the next step is to mainstream the production of the accounts into regular statistical production process and mainstream its use in policy. This entails the regular production of input data according to agreed metadata outlining the definitions, classifications, data sources and methods and establishment of regular data flows formalized through for example memorandum of understanding with different agencies.

Promoting the use of the accounts into policy is key to the uptake of the SEEA EA in a country. This would require presenting the results in a compelling narrative, for example in the form of policy briefs. The use of the accounts in scenario analysis may also support making the case for the compilation of the accounts.

**Capacity building and communication**

Throughout the implementation of the SEEA EA, it is important to build capacity on the compilation of as well as the use of accounts in policies. A number of E-learnings have been developed and are available on the UNSD website[11]. National and regional workshops that bring together different stakeholders are also an excellent opportunity for training and pulling expertise from the various communities and learning from other countries. The Forum of Experts on Ecosystem Accounting as well as the communities of practice are a practical way to exchange experience and learn from those countries that are more advanced in the implementation.

Considering that ecosystem accounting is a new area of statistics which sits at the intersection of accounting, geospatial information, ecology and environmental economics and which can support a number of policies including climate change, biodiversity and broader macro economic policies that go beyond GDP, a communication strategy throughout the implementation process will support the understanding of its use and uptake into policies.

[11] E-learning on the SEEA Central Framework, SEEA Ecosystem Accounting (currently being updated), SEEA Energy, SEEA Water, policy applications of the SEEA are available https://seea.un.org/content/seea-e-learning-resources