



System of
Environmental
Economic
Accounting

Adoption of SEEA Ecosystem Accounting as an International Statistical Standard

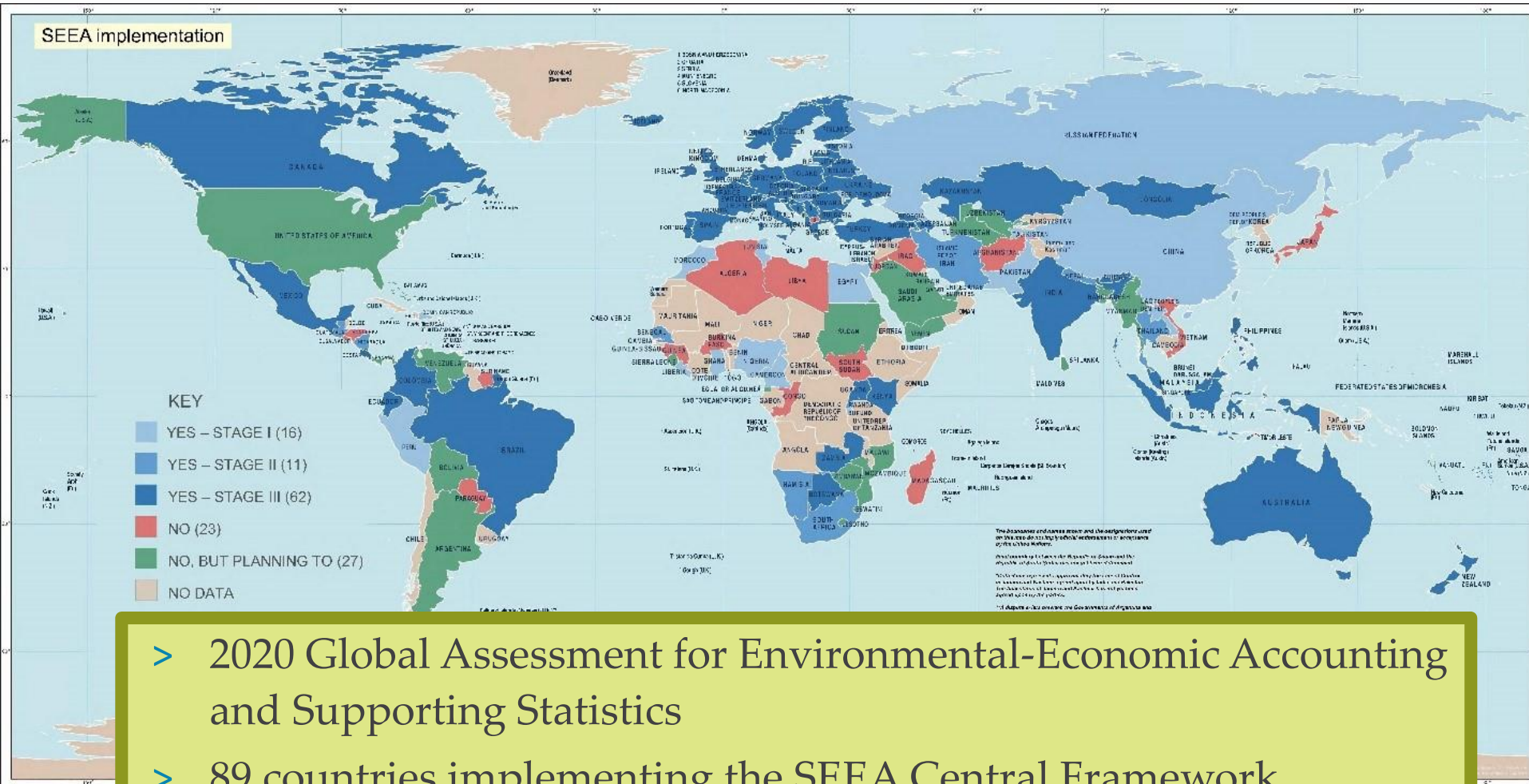
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SEEA implementation



- > 2020 Global Assessment for Environmental-Economic Accounting and Supporting Statistics
- > 89 countries implementing the SEEA Central Framework
- > 34 countries compiling SEEA Ecosystem Accounts
- > 27 countries planning to start implementation of the SEEA



Decision from UNSC 2021

The United Nations Statistical Commission at its 52nd session in March 2021

- Agreed to remove the “Experimental” from the title of the revised SEEA Ecosystem Accounting, adopt chapters 1-7 describing the accounting framework and the physical accounts as an international statistical standard, keep all chapters together in one document, with chapters 8-11 describing monetary valuation and integrated accounting for ecosystem services and assets, and chapters 12-14 describing the applications and extensions, and regularly evaluate and report on the usefulness and pertinence of the accounts; (decision 8c)
- Recognized that, Chapters 8-11 of the SEEA Ecosystem Accounting describe internationally recognized statistical principles and recommendations for the valuation of ecosystem services and assets in a context that is coherent with the concepts of System of National Accounts for countries which are undertaking valuation of ecosystem services and/or assets, and requested the Committee to promptly resolve the outstanding methodological aspects in chapters 8-11 as identified in the research agenda; (decision 8d)

Decision from UNSC 2021

The United Nations Statistical Commission at its 52nd session in March 2021

- Encouraged countries to implement the SEEA Ecosystem Accounting depending on their priorities and, recognizing the challenges to compiling the accounts in practice, requested the Committee to continue to develop compilation tools which make use of global data sources and to create an implementation strategy and methodological and implementation guidance materials for countries in support of continued capacity building; (8f)
- Welcomed the progress of the Committee in mainstreaming the use of the SEEA in policy, including climate change, circular economy, sustainable finance, and biodiversity policy, and particularly encouraged the Committee to engage in the monitoring framework of the post-2020 global biodiversity agenda and participate in the proposed expert group under the auspices of the Secretariat of the Convention on Biological Diversity to provide the connection between the biodiversity and official statistical communities; (decision 8g)

SEEA Ecosystem Accounting

- One integrated document, remove “Experimental”
- Chapters 1-7 on accounting framework and physical accounts adopted as an international statistical standard
- Chapters 8-11 on valuation
 - describe internationally recognized statistical principles and recommendations for the valuation of ecosystem services and assets in a context that is coherent with the concepts of System of National Accounts for countries which are undertaking valuation of ecosystem services and/or assets, and requested the Committee to promptly resolve the outstanding methodological aspects in chapters 8-11 as identified in the research agenda
- Chapters 12-14 on applications and extensions
- Next
 - Encourage countries to implement the SEEA Ecosystem Accounting
 - Implementation guidelines
 - Guidelines for biophysical modelling, valuation, scenario analysis
 - ARIES for SEEA

Outline of SEEA EA

Section: A

Introduction and overview

- Ch.1: Introduction
- Ch.2: Principles of ecosystem accounting

Section B

Accounting for ecosystem extent and condition

- Ch.3: Spatial units for ecosystem accounting
- Ch.4: Accounting for ecosystem extent
- Ch.5: Accounting for ecosystem condition

Section C: Accounting for ecosystem services

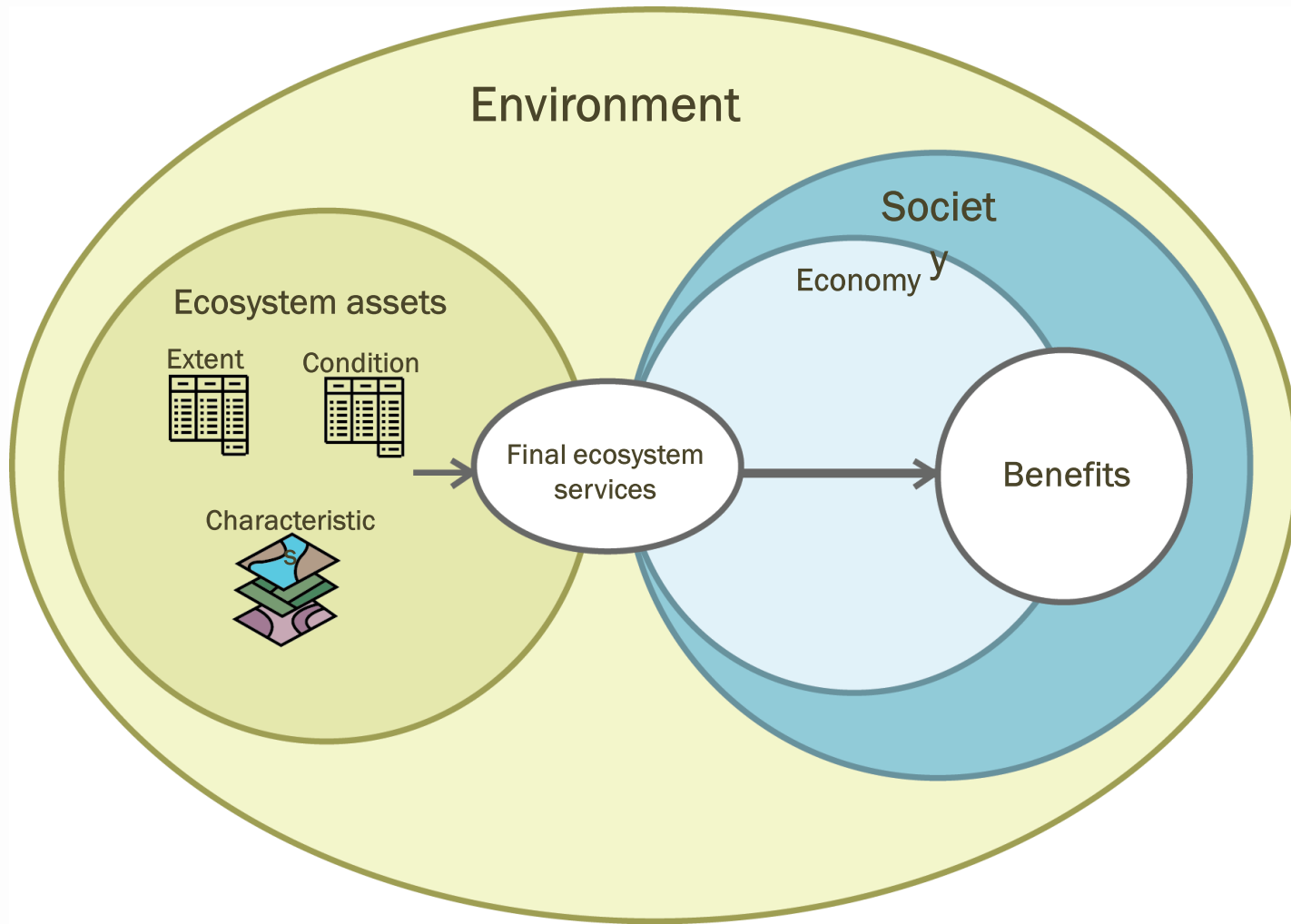
- Ch.6: Ecosystem services concepts for accounting
- Ch.7: Accounting for ecosystem services in physical terms

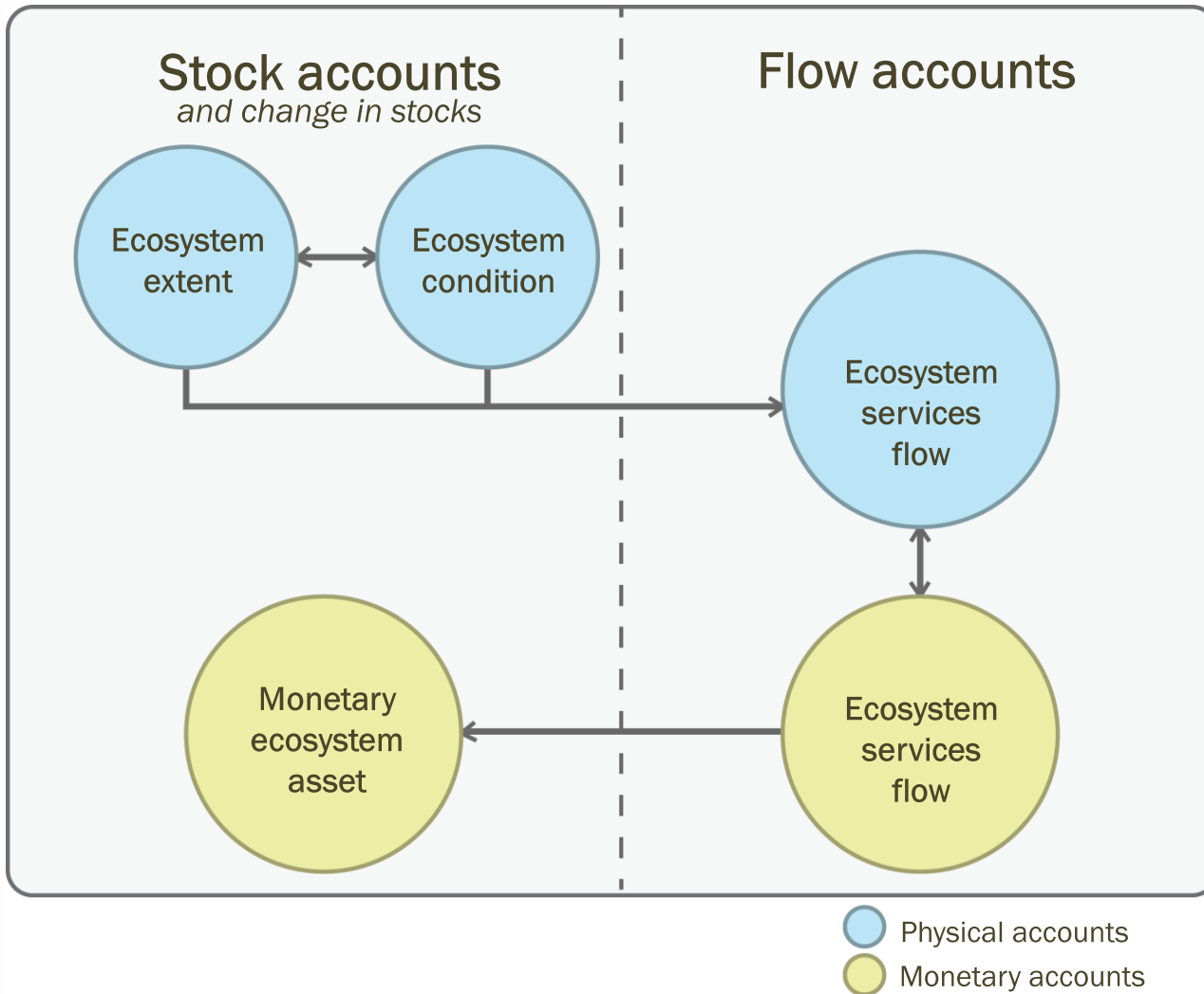
Section D: Monetary valuation and integrated accounting of ecosystem services and assets

- Ch. 8 Principles of monetary valuation for ecosystem accounting
- Ch. 9 Accounting for ecosystem services in monetary terms
- Ch. 10 Accounting for ecosystem assets in monetary terms
- Ch. 11. Integrated and extended accounting for ecosystem services and assets

Section E: Complementary valuations, thematic accounting and indicators

- Ch.12: Complementary approaches to valuation
- Ch.13: Accounting for specific environmental themes
- Ch.14: Indicators and combined presentations





Reference list of ecosystem services

ECOSYSTEM SERVICE		DESCRIPTION
Provisioning services		
Biomass provisioning services	Crop provisioning services *	Crop provisioning services are the ecosystem contributions to the growth of cultivated plants that are harvested by economic units for various uses including food and fibre production, fodder and energy. This is a final ecosystem service.
	Grazed biomass provisioning services *	Grazed biomass provisioning services are the ecosystem contributions to the growth of grazed biomass that is an input to the growth of cultivated livestock. This service excludes the ecosystem contributions to the growth of crops used to produce fodder for livestock (e.g., hay, soyameal). These contributions are included under crop provisioning services. This is a final ecosystem service but may be intermediate to livestock provisioning services.
	Livestock provisioning services *	Livestock provisioning services are the ecosystem contributions to the growth of cultivated livestock and livestock products (e.g., meat, milk, eggs, wool, leather), that are used by economic units for various uses, primarily food production. This is a final ecosystem service. No distinct livestock provisioning services to be recorded if grazed biomass provisioning services are recorded as a final ecosystem service.
	Aquaculture provisioning services	Aquaculture provisioning services are the ecosystem contributions to the growth of animals and plants (e.g. fish, shellfish, seaweed) in aquaculture facilities that are harvested by economic units for various uses. This is a final ecosystem service.
	Wood provisioning services	Wood provisioning services are the ecosystem contributions to the growth of trees and other woody biomass in both cultivated (plantation) and uncultivated production contexts that are harvested by economic units for various uses including timber production and energy. This service excludes contributions to non-wood forest products. This is a final ecosystem service.
	Wild fish and other natural aquatic biomass provisioning services	Wild fish and other natural aquatic biomass provisioning services are the ecosystem contributions to the growth of fish and other aquatic biomass that are captured in uncultivated production contexts by economic units for various uses, primarily food production. This is a final ecosystem service
	Wild animals, plants and other biomass provisioning services	Wild animals, plants and other biomass provisioning services are the ecosystem contributions to the growth of wild animals, plants and other biomass that are captured and harvested in uncultivated production contexts by economic units for various uses. The scope includes non-wood forest products (NWFP) and services related to hunting, trapping and bio-prospecting activities; but excludes wild fish and other natural aquatic biomass (included in previous class). This is a final ecosystem service
Genetic material services	Genetic material services are the ecosystem contributions from all biota (including seed, spore or gamete production) that are used by economic units, for example (i) to develop new animal and plant breeds; (ii) in gene synthesis; or (iii) in product development directly using genetic material. This is most commonly recorded as an intermediate service to biomass provisioning.	
Water supply *	Water supply services reflect the combined ecosystem contributions of water flow regulation, water purification, and other ecosystem services to the supply of water of appropriate quality to users for various uses including household consumption. This is a final ecosystem service.	
Other provisioning services		

Regulating and maintenance services		
Global climate regulation services		Global climate regulation services are the ecosystem contributions to the regulation of the chemical composition of the atmosphere and oceans that affect global climate through the accumulation and retention of carbon and other GHG (e.g., methane) in ecosystems and the ability of ecosystems to remove (sequester) carbon from the atmosphere. This is a final ecosystem service.
Rainfall pattern regulation services (at sub-continental scale)		Rainfall pattern regulation services are the ecosystem contributions of vegetation, in particular forests, in maintaining rainfall patterns through evapotranspiration at the sub-continental scale. Forests and other vegetation recycle moisture back to the atmosphere where it is available for the generation of rainfall. Rainfall in interior parts of continents fully depends upon this recycling. This may be a final or intermediate service.
Local (micro and meso) climate regulation services		Local climate regulation services are the ecosystem contributions to the regulation of ambient atmospheric conditions (including micro and mesoscale climates) through the presence of vegetation that improves the living conditions for people and supports economic production. Examples include the evaporative cooling provided by urban trees ('green space'), the role of urban water bodies ('blue space') and the contribution of trees in providing shade for humans and livestock. This may be a final or intermediate service.
Air filtration services		Air filtration services are the ecosystem contributions to the filtering of air-borne pollutants through the deposition, uptake, fixing and storage of pollutants by ecosystem components, particularly plants, that mitigates the harmful effects of the pollutants. This is most commonly a final ecosystem service.
Soil quality regulation services		Soil quality regulation services are the ecosystem contributions to the decomposition of organic and inorganic materials and to the fertility and characteristics of soils, e.g., for input to biomass production. This is most commonly recorded as an intermediate service.
Soil and sediment retention services	Soil erosion control services	Soil erosion control services are the ecosystem contributions, particularly the stabilising effects of vegetation, that reduce the loss of soil (and sediment) and support use of the environment (e.g., agricultural activity, water supply). This is may be recorded as a final or intermediate service.
	Landslide mitigation services	Landslide mitigation services are the ecosystem contributions, particularly the stabilising effects of vegetation, that mitigates or prevents potential damage to human health and safety and damaging effects to buildings and infrastructure that arise from the mass movement (wasting) of soil, rock and snow. This is a final ecosystem service.
Solid waste remediation services		Solid waste remediation services are the ecosystem contributions to the transformation of organic or inorganic substances, through the action of micro-organisms, algae, plants and animals that mitigates their harmful effects. This is may be recorded as a final or intermediate service.
Water purification services (water quality regulation)	Retention and breakdown of nutrients	Water purification services are the ecosystem contributions to the restoration and maintenance of the chemical condition of surface water and groundwater bodies through the breakdown or removal of nutrients and other pollutants by ecosystem components that mitigate the harmful effects of the pollutants on human use or health. This may be recorded as a final or intermediate ecosystem service.
	Retention and breakdown of other pollutants	
Water flow regulation services	Baseline flow maintenance services	Water regulation services are the ecosystem contributions to the regulation of river flows and groundwater and lake water tables. They are derived from the ability of ecosystems to absorb and store water, and gradually release water during dry seasons or periods through evapotranspiration and hence secure a regular flow of water. This may be recorded as a final or intermediate ecosystem service.
	Peak flow mitigation services	Water regulation services are the ecosystem contributions to the regulation of river flows and groundwater and lake water tables. They are derived from the ability of ecosystems to absorb and store water, and hence mitigate the effects of flood and other extreme water-related events. Peak flow mitigation services will be supplied together with river flood mitigation services in providing the benefit of flood protection. This is a final ecosystem service.
Flood control services	Coastal protection services	Coastal protection services are the ecosystem contributions of linear elements in the seascape, for instance coral reefs, sand banks, dunes or mangrove ecosystems along the shore, in protecting the shore and thus mitigating the impacts of tidal surges or storms on local communities. This is a final ecosystem service.
	River flood mitigation services	River flood mitigation services are the ecosystem contributions of riparian vegetation which provides structure and a physical barrier to high water levels and thus mitigates the impacts of floods on local communities. River flood mitigation services will be supplied together with peak flow mitigation services in providing the benefit of flood protection. This is a final ecosystem service.
Storm mitigation services		Storm mitigation services are the ecosystem contributions of vegetation including linear elements, in mitigating the impacts of wind, sand and other storms (other than water related events) on local communities. This is a final ecosystem service.
Noise attenuation services		Noise attenuation services are the ecosystem contributions to the reduction in the impact of noise on people that mitigates its harmful or stressful effects. This is most commonly a final ecosystem service.
Pollination services		Pollination services are the ecosystem contributions by wild pollinators to the fertilization of crops that maintains or increases the abundance and/or diversity of other species that economic units use or enjoy. This may be recorded as a final or intermediate service.
Biological control services	Pest control services	Biological control services are the ecosystem contributions to the reduction in the incidence of species that may prevent or reduce the effects of pests on biomass production processes or other economic and human activity. This is may be recorded as a final or intermediate service.
	Disease control services	Disease control services are the ecosystem contributions to the reduction in the incidence of species that may prevent or reduce the effects of species on human health. This is most commonly a final ecosystem service.
Nursery population and habitat maintenance services		Nursery population and habitat maintenance services are the ecosystem contributions necessary for sustaining populations of species that economic units ultimately use or enjoy either through the maintenance of habitats (e.g., for nurseries or migration) or the protection of natural gene pools. This service is an intermediate service and may input to a number of different final ecosystem services including biomass provision and recreation-related services.
Other regulating and maintenance services		

Cultural services	
Recreation-related services	Recreation-related services are the ecosystem contributions, in particular through the biophysical characteristics and qualities of ecosystems, that enable people to use and enjoy the environment through direct, in-situ, physical and experiential interactions with the environment. This includes services to both locals and non-locals (i.e. visitors, including tourists). Recreation-related services may also be supplied to those undertaking recreational fishing and hunting. This is a final ecosystem service.
Visual amenity services *	Visual amenity services are the ecosystem contributions to local living conditions, in particular through the biophysical characteristics and qualities of ecosystems that provide sensory benefits, especially visual. This service combines with other ecosystem services, including recreation-related services and noise attenuation services to underpin amenity values. This is a final ecosystem service.
Education, scientific and research services	Education, scientific and research services are the ecosystem contributions, in particular through the biophysical characteristics and qualities of ecosystems, that enable people to use the environment through intellectual interactions with the environment. This is a final ecosystem service.
Spiritual, artistic and symbolic services	Spiritual artistic and symbolic services are the ecosystem contributions, in particular through the biophysical characteristics and qualities of ecosystems, that are recognised by people for their cultural, historical, aesthetic, sacred or religious significance. These services may underpin people's cultural identity and may inspire people to express themselves through various artistic media. This is a final ecosystem service.
Other cultural services	

Alignment of SEEA and GEP

- As part of the NCAVES project two meetings were held in 2020 that brought together the SEEA and GEP experts in order to arrive to a general agreement that that the GEP and SEEA conceptual frameworks and also apply similar concepts.
- Some differences in application and measurement exist, but these are mostly due to data availability.
- See>>:
<https://seea.un.org/Expert%20Meeting%20on%20Aligning%20SEEA%20and%20GEP>

GEP in SEEA EA

Para 9.17: Aggregate measures of ecosystem services can be derived by summing across columns (i.e., to estimate the total supply or use of a single service) and by summing across rows (i.e. to estimate the total supply by an ecosystem type or the total use by type of economic unit). The aggregate measure gross ecosystem product (GEP) is equal to the sum of all final ecosystem services (i.e., used by economic units) at their exchange value supplied by all ecosystem types located within an ecosystem accounting area over an accounting period less the net imports of intermediate services. In cases where the net imports of intermediate services, i.e., imports less exports of intermediate services (see section 7.4.6) are small GEP may be assumed to be the sum of final ecosystem services supplied by the EAA.

Table 14.4: Potential indicators on monetary ecosystem services flows account and ecosystem asset accounts

Monetary indicators	Further description	Spatial unit	Disaggregation	Unit of measurement
Gross Ecosystem Product (GEP)	Sum of all final ecosystem services (i.e., used by economic units) at their exchange value supplied by all ecosystem types located within an ecosystem accounting area over an accounting period less the imports of ecosystem services from ecosystem assets outside the EAA.	Ecosystem accounting area	Ecosystem type, ecosystem services classes	Local currency

SEEA , GEP and Post-2020

- The Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) at its recent meeting in May 2021 :
 - > *“Recognizes the value of aligning national monitoring with the **United Nations System of Environmental-Economic Accounting statistical standard** in order to mainstream biodiversity in national statistical systems and to strengthen national information and monitoring systems and reporting”*
- The discussion on the headline indicators for the post-2020 global biodiversity framework is ongoing. Below is a selected list of **proposed headline indicators that can be derived from the SEEA EA accounts:**
 - > A.01 Extent of selected natural ecosystem
 - > **B.0.1. Value of all final ecosystem services (Gross Ecosystem Product)**
 - > 6.01 Proportion of water with good ambient water quality
 - > 7.01 Total climate regulation services provided by ecosystems
 - > 8.0.1 Number of people using wild resources for energy, food or culture
 - > 10.0.2 Ecosystems providing reduced coastal erosion flood protection and other services
 - > 11.0.1 Average share of the built-up area of cities that is green/blue space for public use for all
 - > 13.0.2 Integration of biodiversity into national accounting and reporting systems, defined as implementation of the System of Environmental-Economic Accounting
 - > 15.0.1 Biomass material footprint per capital

