System of Environmental Economic Accounting

Compiling Indicators Using SEEA EA

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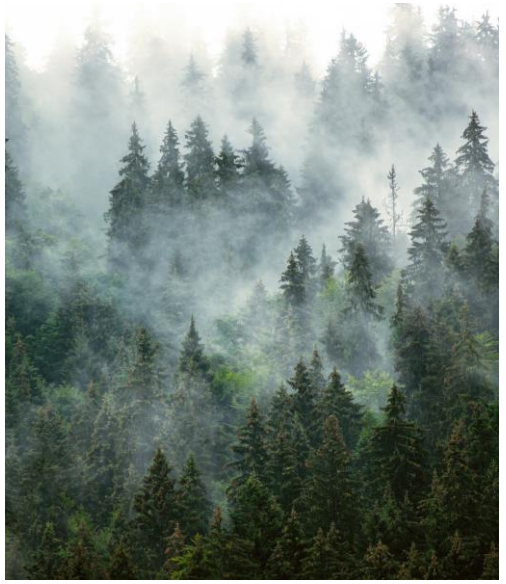
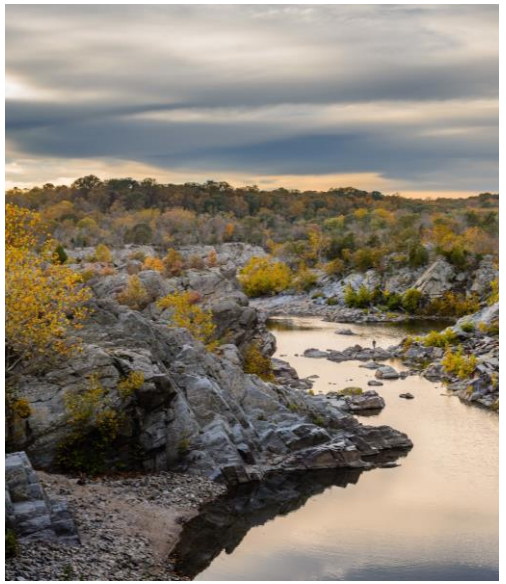
United Nations

The Need

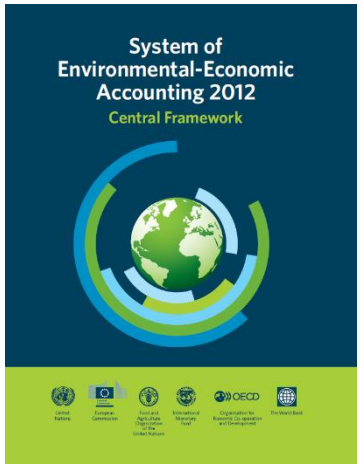
- Our economy and well-being crucially depends on nature
- But headline indicators like GDP do not capture these vital contributions.
- As a result, decision makers don't have access to key information necessary to effectively pursue and track sustainable development.
- The System of Environmental Economic Accounts (SEEA) fills that gap.
- SEEA integrates information on the economy and the environment showing their interrelationship complementing the System of National Accounts

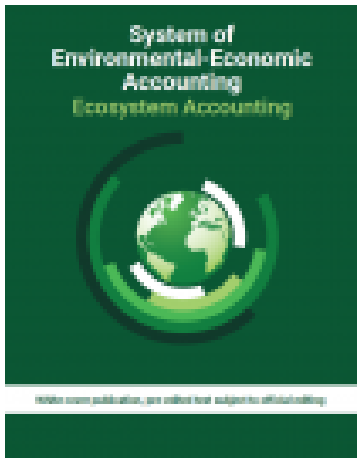




Standardization of measurement of the environment

- SEEA Central Framework (SEEA CF) adopted as statistical standard through an intergovernmental process (ECOSOC / United Nations Statistical Commission) in 2013
- SEEA Ecosystem Accounting (SEEA EA) discussed in March 2021
  - > chapters 1-7 describing the accounting framework and the physical accounts adopted as an international statistical standard
  - > chapters 8-11 recognized as describing 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
  - > Chapters 12-14 describing the applications and extensions
- SEEA status of implementation 2020:
  - > 89 countries implementing the SEEA Central Framework
  - > 34 countries compiling SEEA Ecosystem Accounts
  - > 27 countries planning to start implementation of the SEEA





Outline of SEEA EA

- Section A: Introduction and overview (Ch.1-2)
  - Ch.1: Introduction
  - Ch.2: Principles of ecosystem accounting
- Section B: Accounting for ecosystem extent and condition (Ch. 3-5)
- Section C: Accounting for ecosystem services (Ch. 6-7)
- Section D: Monetary valuation and integrated accounting for ecosystem services and assets (Ch. 8-11)
- Section E: Applications and extensions of SEEA EA
  - Ch.12: Complementary approaches to valuation
  - Ch.13: Accounting for specific environmental themes
  - Ch.14: Indicators and combined presentations

Process of drafting indicator chapter in the SEEA EA

- June 2020
  - Initial version of the annotated outline agreed by SEEA EEA Technical Committee
- July & August 2020
  - Development of the working paper on SEEA EEA indicators to serve as input for the drafting of the indicator chapter
  - Comment on draft monitoring framework for the post-2020 global biodiversity framework
- Sept 2020
  - Establishment of the SEEA EA indicator working group to support the drafting of the indicator chapter in the short term and link the SEEA EEA indicators to existing monitoring framework in the medium term
  - 1st meeting of the working group conducted to seek comments on the working paper and input to the drafting process
- October 2020
  - Initial drafting of the indicator chapter completed
  - Completed draft of SEEA EA circulated for global consultation
- November 2020
  - SEEA EEA Forum to discuss the indicator chapter
- January 2021
  - 2nd SEEA EA working group meeting
  - Revised draft chapter 14 circulated for circulated for final review
- Feb 2021
  - Final draft of SEEA EA submitted to UNSC for adoption
- March 2021: Adoption of the SEEA EA

Outline of Ch.14 of the SEEA EA

14.1 Introduction

14.2 Indicators derived from the SEEA EA
- 14.2.1 Introduction
- 14.2.2 Roles and functions of SEEA EA indicators
- 14.2.3 Indicators from the ecosystem accounts
- 14.2.4 Indicators from thematic accounts

14.3 Indicator frameworks and the SEEA EA
- 14.3.1 SEEA EA and global indicator monitoring frameworks
- 14.3.2 Other indicators and applications

14.4 Combined presentations for ecosystem accounting
- 14.4.1 Introduction
- 14.4.2 Information on environmental activities
- 14.4.3 Economic dependence on ecosystems
- 14.4.4 Information on policy instruments
- 14.4.5 Using the driving forces-pressure-state-impact-response (DPSIR) framework

Annex A14.1: SEEA EA and the post-2020 global biodiversity framework

Deriving indicators using the SEEA EA

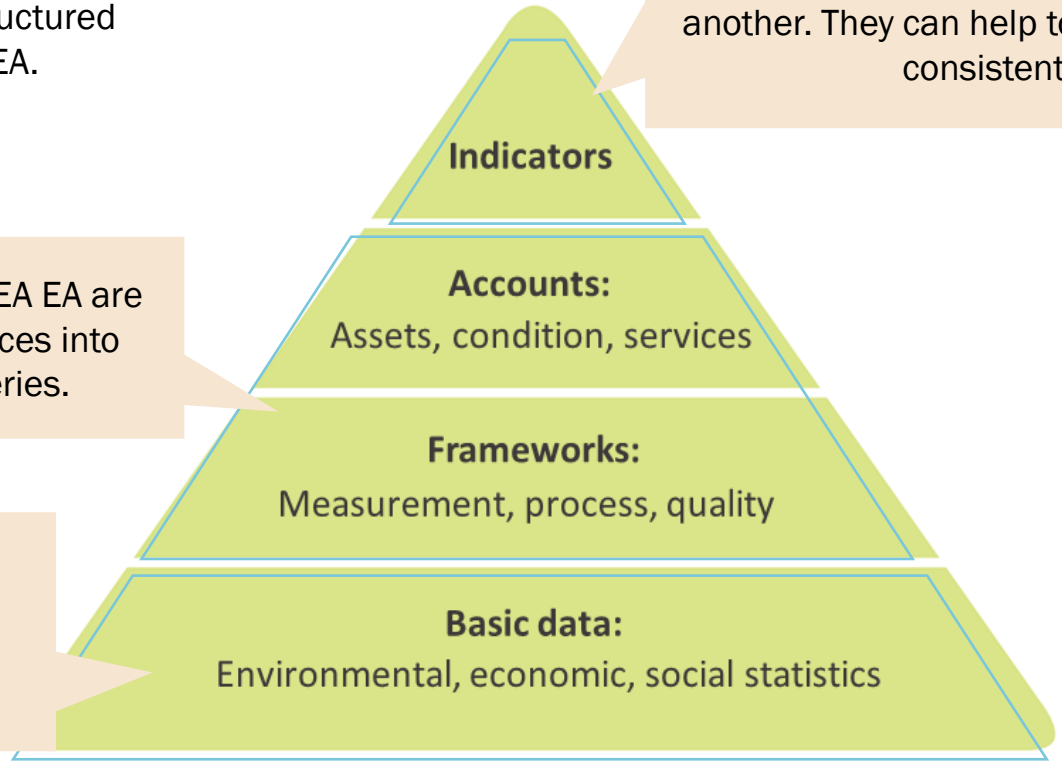
Benefits of the use of structured data

For the most part, indicators used in decision making today are not based on data that have been structured in an accounting framework such as the SEEA EA.

Indicators based on data that use the same basic definitions, classifications or spatial coverage can be readily compared with one another. They can help to assess policy in a consistent way.

Accounting frameworks like the SEEA EA are structuring data from multiple sources into comparable and consistent time series.

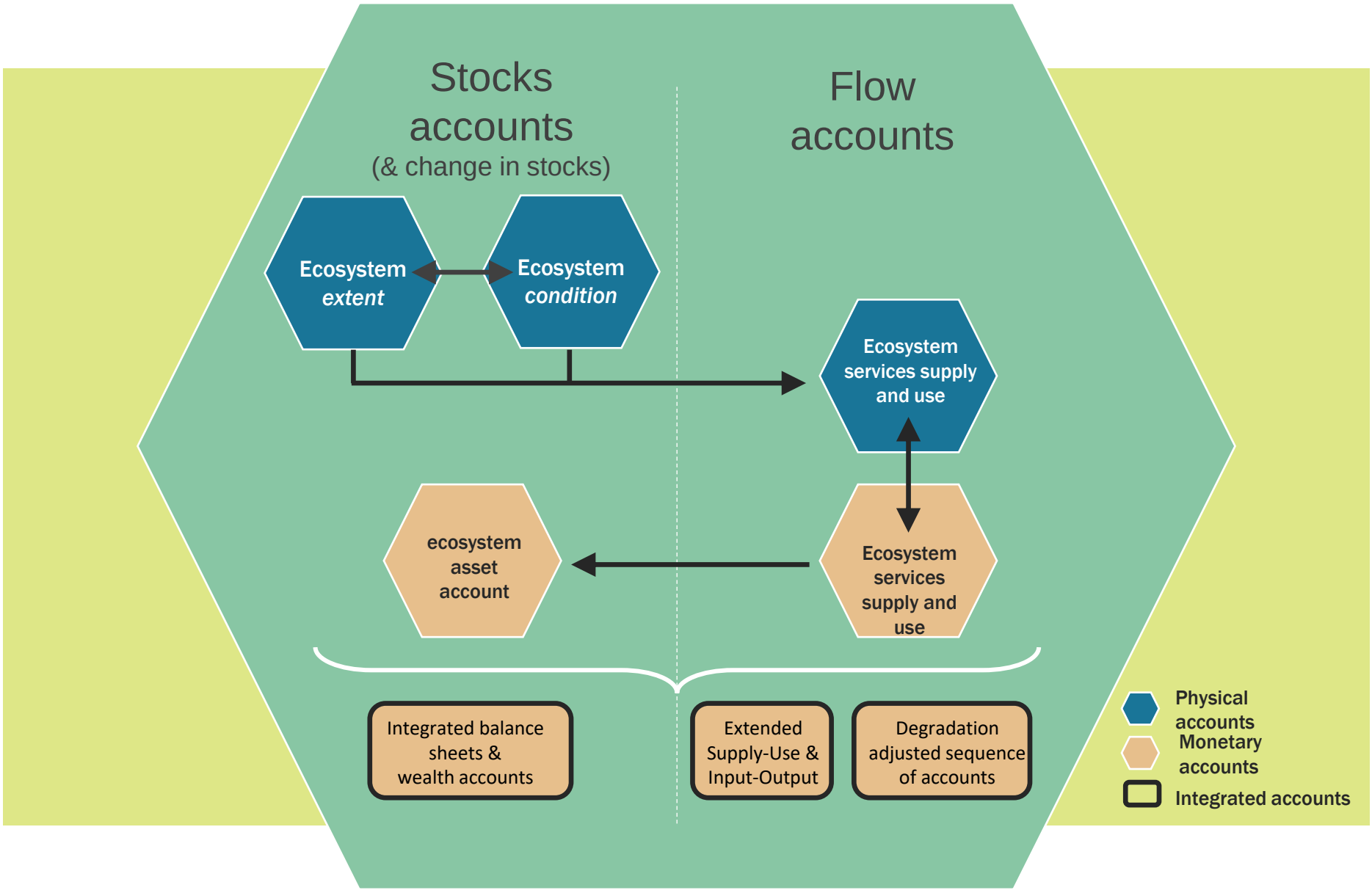
Use of unstructured data to compile indicators can lead to challenges in comparability and consistency across indicators that affect their usefulness in decision making.



Types of indicators that may be derived from the SEEA EA

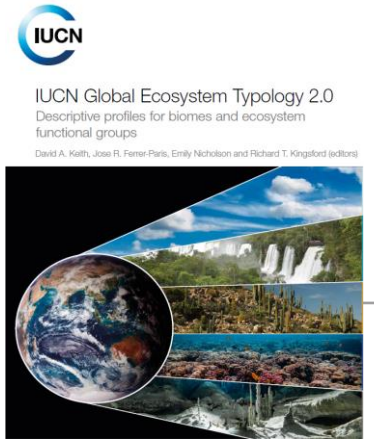
Combinations of data from related categories, for example, summing the areas of forest ecosystems across an accounting area	**Aggregate indicators**
Combinations of different variables using a weighting pattern or aggregation rule to communicate the overall movement or trend, for example, on the condition of the ecosystem	**Composite indices**
Combinations of data from different accounts to reveal how many times one number contains another, for example ecosystem service provision per hectare of land	**Ratio indicators**

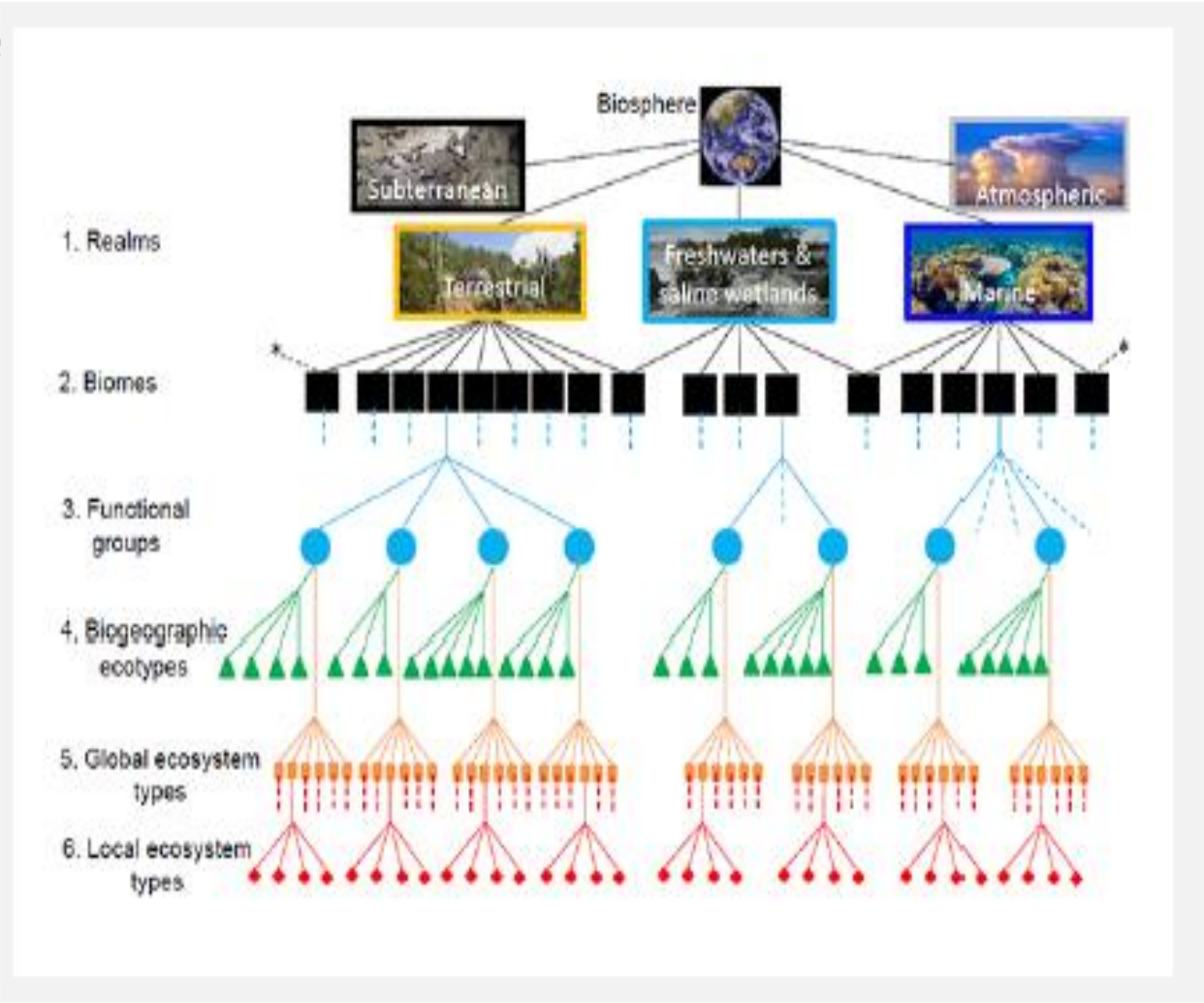
- Like many aggregate indicators, **total area** is derived by simple addition across a selected category to provide information at a broader level.
- Calculating the composite index of **ecosystem condition** in the SEEA EA involves weighting together relevant ecosystem condition indicators.
- The ratio indicator, such as **ecosystem service provision per hectare,** is derived by combining data from ecosystem services accounts and ecosystem extent accounts.


Stocks accounts
(& change in stocks)
Flow accounts
Ecosystem extent
Ecosystem condition
Ecosystem services supply and use
ecosystem asset account
Ecosystem services supply and use
Integrated balance sheets & wealth accounts
Extended Supply-Use & Input-Output
Degradation adjusted sequence of accounts
Physical accounts
Monetary accounts
Integrated accounts

Ecosystem types

- SEEA EA endorses the IUCN GET as international reference classification
- 6 levels – accounts are compiled at level of the Ecosystem Functional Groups (e.g. tropical lowland rainforest)



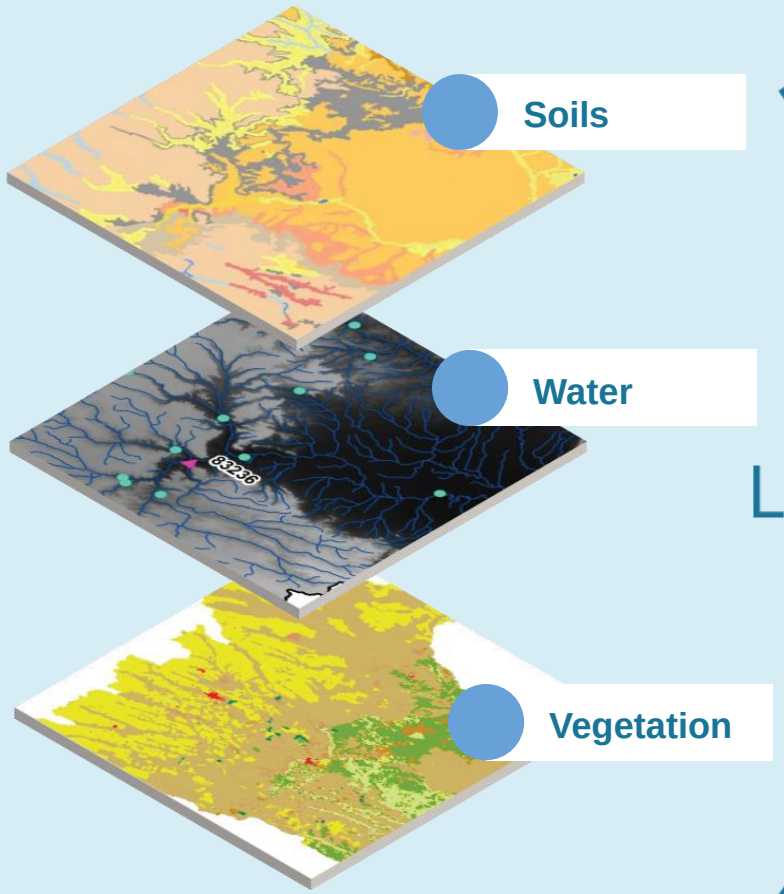


Realms	Biomes
Terrestrial	T1 Tropical–subtropical forests
	T2 Temperate–boreal forests & woodlands
	T3 Shrublands & shrubby woodlands
	T4 Savannas and grasslands
	T5 Deserts and semi-deserts
	T6 Polar-alpine
	T7 Intensive land-use systems
Freshwater	F1 Rivers and streams
	F2 Lakes
	F3 Artificial fresh waters
Marine	M1 Marine shelfs
	M2 Pelagic ocean waters
	M3 Deep sea floors
	M4 Anthropogenic marine systems
Subterranean	S1 Subterranean lithic
	S2 Anthropogenic subterranean voids
Transitional	TF1 Palustrine wetlands
	FM1 Semi-confined transitional waters
	MT1 Shoreline systems
	MT2 Supralittoral coastal systems
	MT3 Anthropogenic shorelines
	MFT1 Brackish tidal systems
	SF1 Subterranean freshwaters
	SF2 Anthropogenic subterranean freshwaters
	SM1 Subterranean tidal

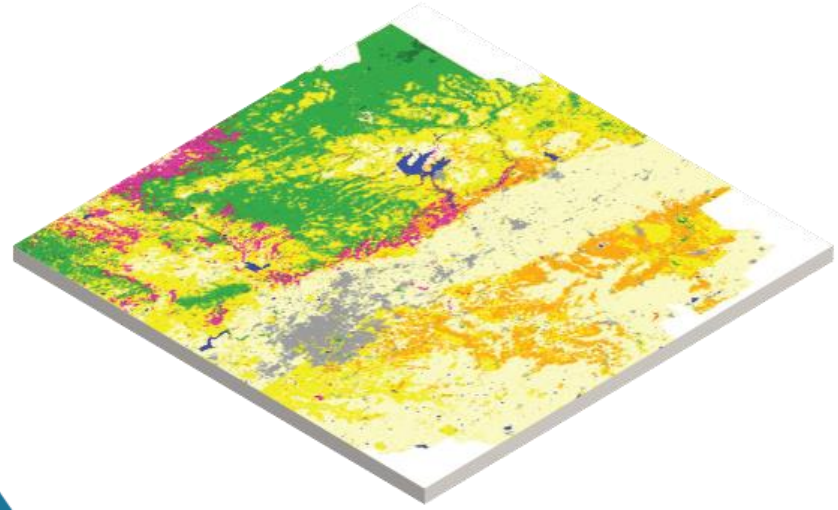
Potential indicators on ecosystem extent

Extent indicators	Spatial unit	Disaggregation	Measurement unit
Ecosystem accounting area covered by specific types or areas of interest including: Urban areas (IUCN GET T7.4) Cultivated areas (IUCN GET T7.1, T7.2, T7.3) Forests (IUCN GET T1, T2) Wetlands (IUCN GET F1, F2, TF1, FM1, MFT1) Coastal areas (IUCN GET M1, MT1, MT2, MT3, MFT1)	Ecosystem accounting area	Ecosystem type	Hectares; % of total EAA; % of opening
Change of area covered by specific ecosystem types or areas of interest during an accounting period including: Urban areas (IUCN GET T7.4) Cultivated areas (IUCN GET T7.1, T7.2, T7.3) Forests (IUCN GET T1, T2) Wetlands (IUCN GET F1, F2, TF1, FM1, MFT1) Coastal areas (IUCN GET M1, MT1, MT2, MT3, MFT1)	Ecosystem accounting area	Ecosystem type	% of opening
Percentage of area unchanged (opening stock – reduction)	Ecosystem accounting area	Ecosystem type	% of opening

Extent Account



Layers

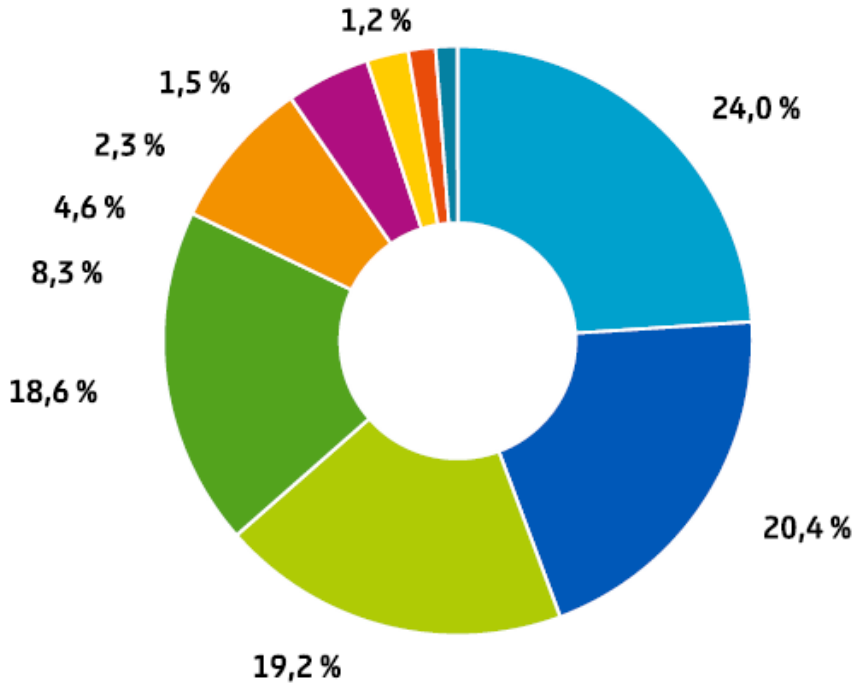


	Grassland	Forest Areas	Herbaceous Crops
Opening Extent	1,332	645	420
Additions	15	0	64
Reduction	37	42	0
Closing Extent	1,110	603	484
Net Change in Extent	-22	-42	64
Turnover	52	42	64

Extent account for the Netherlands

	Extent (km²) 2013	Increase (km²) 2013-2015	Decrease (km²) 2013-2015	Net change (km²) 2013-2015	Extent (km²) 2015	Increase (km²) 2015-2018	Decrease (km²) 2015-2018	Net change (km²) 2015-2018	Extent (km²) 2018
Total	41.542	3.357	3.357	0	41.542	3.629	3.629	0	41.542
Forest	3.475	74	106	-32	3.443	84	106	-22	3.422
Open nature	1.892	230	246	-17	1.876	240	235	5	1.881
Wetlands	612	42	29	13	625	44	38	6	631
Dunes, beach	497	18	20	-3	494	32	27	5	499
Water	7.861	64	47	17	7.879	86	45	41	7.920
Cropland	8.719	938	1.271	-332	8.386	1.238	1.208	30	8.416
Grassland	9.697	1.467	1.124	343	10.040	1.347	1.471	-123	9.917
Horticulture	203	12	19	-7	196	15	13	2	198
Other agr.	61	27	44	-18	43	34	31	2	46
Build up	7.636	382	373	9	7.645	399	370	29	7.674
Public green	888	104	78	27	915	111	86	25	940

Extent ecosystem types, 2018



Potential indicators on ecosystem condition

Ecosystem condition

- (across ETs) Overall ecosystem condition index [expressed as a number between 0 and 1]
- (per ET) Ecosystem condition index [expressed as a number between 0 and 1]
- (per ECT group) Condition [e.g. ecosystem fragmentation; species abundance]

Table 5.1: The SEEA Ecosystem Condition Typology (SEEA ECT)

	ECT groups	ECT classes
Ecosystem condition	Abiotic ecosystem characteristics	1. Physical state characteristics (including soil structure, water availability)
		2. Chemical state characteristics (including soil nutrient levels, water quality, air pollutant concentrations)
	Biotic ecosystem characteristics	3. Compositional state characteristics (including species-based indicators)
		4. Structural state characteristics (including vegetation, biomass, food chains)
		5. Functional state characteristics (including ecosystem processes, disturbance regimes)
	Landscape level characteristics	6. Landscape and seascape characteristics (including landscape diversity, connectivity, fragmentation, embedded semi-natural elements in farmland)

Ecosystem condition indicators	Further description	Spatial unit	Disaggregation	Measurement unit
Overall ecosystem condition index		Ecosystem accounting area	Ecosystem type, ecosystem condition classes	Index
Physical state indicator	Overall physical state characteristics of an ecosystem asset (including soil structure, water availability, ocean temperature)	Ecosystem type	Ecosystem condition subclasses	Index
Chemical state indicator	Overall chemical state characteristics of an ecosystem asset (including soil nutrient levels, water quality, biogeochemistry, air pollutant concentrations)	Ecosystem type	Ecosystem condition subclasses	Index
Compositional state indicator	Overall compositional state characteristics of an ecosystem asset (including species diversity)	Ecosystem type	Ecosystem condition subclasses	Index
Structural state indicator	Overall structural state characteristics of an ecosystem asset (including vegetation (and biotic structure), biomass, food chains)	Ecosystem type	Ecosystem condition subclasses	Index
Functional state indicator	Overall functional state characteristics of an ecosystem asset (including ecosystem process, disturbances regimes)	Ecosystem type	Ecosystem condition subclasses	Index
Landscape/ seascape indicator	Overall characteristics of landscape/seascape (including landscape diversity, connectivity fragmentation, embedded semi-natural elements in farmland, coastal engineering)	Ecosystem type	Ecosystem condition subclasses	Index

Example: Summary of the condition of UK woodlands 2020

Table 1: Summary of the condition of UK woodlands				
Type	Indicator	Condition	Long term trend	Short term trend
Biodiversity	Butterfly index UK	Long term decline 1990 to 2018	Declining	Little or no change
	Woodland bird index UK	Decrease of 29% between 1970 to 2018	Declining	Declining
	Tree age structure GB	NFI first assessment 42% area unfavourable		
	Regeneration GB	NFI first assessment 0% area unfavourable		
	Veteran trees GB	NFI first assessment 99% area unfavourable		
	Tree health GB	NFI first assessment 85% area favourable		
	Deadwood GB	NFI first assessment 77% area unfavourable		
	Herbivores & grazing GB	NFI first assessment 49% area favourable		
	Invasive plant species GB	NFI first assessment 92% area favourable		
Certified woodlands	Area FSC certified woodlands UK	Improvement 32% from 2001 to 2019	Increasing	Increasing
Space for people	Access to woodlands UK	Improvement 0.1% from 2012 to 2016	Increasing	Increasing
Protected sites	Scotland SSSIs/SACs	51% favourable in 2018		
	England SSSIs	37% favourable 2018/19		
Pressure indicators	Wildfires UK	2019-20 29,396 hectares affected (EFFIS data)	Increasing	Increasing

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Source: Department for Environment, Food and Rural Affairs; British Trust for Ornithology; Royal Society for the Protection of Birds; Joint Nature Conservation Committee; Butterfly Conservation Society; Centre for Ecology and Hydrology; Forest Research; Woodland Trust; and European Forest Fire Information System

Potential indicators on physical ecosystem services flows

Physical ecosystem services flow indicators	Further description	Spatial unit	Disaggregation	Measurement unit
Amount of biomass harvested, including crops, grazed biomass, livestock, wood, non-wood forest products and fish	Biomass provisioning services	Ecosystem accounting area	Ecosystem type; type of biomass	Tonnes
Water abstracted for use by households and industry (proxy measure)	Water supply services	Ecosystem accounting area	Ecosystem type	Cubic metres
Quantity of carbon retained (captured and stored/trend in carbon sequestered)	Global climate regulation services	Ecosystem accounting area	Ecosystem type	Tonnes
Quantity of airborne pollutants captured (e.g. PM10; PM2.5)	Air filtration services	Ecosystem accounting area	Ecosystem type; type of pollutant	Tonnes
Quantity of waterborne pollutants removed (e.g. chemical oxygen demand) from wastewater	Water purification services	Ecosystem accounting area	Ecosystem type; type of pollutant	Tonnes
Number of properties/km of coast/shoreline/riparian zone protected; change in degree of risk	Flood mitigation services	Ecosystem accounting area	Ecosystem type	Count/km
Number of tourist/recreational visits	Recreation-related services	Ecosystem accounting area	Ecosystem type	Count

Example: EU Ecosystem services account 2021 (physical terms)

	Ecosystem types										
				Woodland & forest							
	Urban	Cropland	Grassland	Available for Wood Supply	Other	Wetland	Heathland and shrub	Sparsely vegetated land	Rivers and lakes	Coastal /intertidal area	Total
crop provision (1,000 tonne)		93,936									93,936
timber provision (1,000 m3)				885							885
crop pollination (1,000 tonne)		10,447									10,447
soil retention (mlln tonne)		1,115									1,115
carbon sequestration (mlln tonne)	-	-	-	306		-	-	-	NA	NA	306
flood control (1,000 hectare)	26	313	767	2,923		67	72	0,2	NA	NA	4,170
water purification (1,000 tonne)	510	13,882	2,314	3,032		73	154	45	216		20,166
habitat & species maintenance (mlln euro)	NA	15,731	4,473	12,448		683	1,250	385	689	NA	35,660
nature-based recreation (1,000 nbr visits)	66	3,279	6,237	24,198		1,971	2,318	1,058	778	220	40,125

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Potential indicators for monetary ecosystem service flow accounts and ecosystem asset accounts

Monetary indicators	Further description	Spatial unit	Disaggregation	Measurement unit
Gross ecosystem product (GEP)	GEP is equal to the sum of all final ecosystem services 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	Ecosystem accounting area	Ecosystem type; ecosystem services classes	Local currency
Industry value added linked to ecosystem services	Value added of industries with direct inputs of ecosystem services reflecting extent to which economic activities are dependent on ecosystem services	Ecosystem accounting area	Ecosystem type	Local currency
Monetary ecosystem asset value	End-of-year monetary ecosystem asset value	Ecosystem accounting area	Ecosystem type	Local currency
Cost of degradation	Reduction in monetary ecosystem asset value attributable to ecosystem degradation	Ecosystem accounting area	Ecosystem type per capita for administrative areas, planning areas	Local currency

Example

- Total ecosystem services (GEP) expressed as % of GDP of a country: Country examples
  - Netherlands (2020 publication) 1.9% of GDP
    - *Source: https://www.cbs.nl/en-gb/background/2020/04/monetary-valuation-of-ecosystem-services-for-the-netherlands*
  - UK (2019 published figures): 0.9 % of GDP
    - *Source:https://www.ons.gov.uk/economy/environmentalaccounts/datasets/uknaturalcapitalaccountssupplementaryinformation*
  - South Africa (2017 publication): 7% of GDP
    - *Source: Turpie et al. (2017): Mapping and valuation of South Africa's ecosystem services: A local perspective*

Table 17: Woodland ecosystem asset values, £ million (2018 prices), UK, 2017

Service	2017
Timber	7,306
Wood fuel	1,656
Carbon Sequestration	54,620
Pollution removal	31,673
Urban woodland cooling	4,608
Flood prevention GB	6,513
Noise reduction	833
Recreation	22,534
Total	129,743

SEEA and the SDGs

The UN's 2030 Agenda

The principal indicator framework for monitoring sustainable development today is the UN's 2030 Agenda with its **17 Sustainable Development Goals (SDGs)** and their associated targets and indicators

- The 2030 Agenda represents an ambitious plan for achieving sustainable development. It serves as the basis for countries to shape national policies and priorities.
- At the heart of the agenda is the recognition that true development must combine economic growth and poverty alleviation with strategies that improve health and education, and reduce inequality, while addressing climate change and protecting nature.

Find overall information on the SDGs here

Using the SEEA EA for Calculating Selected SDG Indicators

- Provides a set of suggested steps for the implementation of a national programme of work for calculating SDG target indicators using the SEEA EEA framework.
- Also provides a set of four technical notes for the calculation of SDG Target Indicators 15.1.1, 15.3.1, 6.6.1 and 11.7.1 using the SEEA EA.
- Developed by UNEP-WCMC & UNSD as part of the Natural Capital Accounting and Valuation of Ecosystem services (NCAVES) project

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Available at https://seea.un.org/sites/seea.un.org/files/documents/Indicators/3._using_the_seea_ea_for_calculating_selected_sdg_indicators.pdf

Technical Notes for subset of priority SDG Indicators

- SDG 15.1.1: Forest area as a proportion of total land area
- SDG 15.3.1: Proportion of land that is degraded over total land area

- SDG 6.6.1: Change in the extent of water related ecosystems over time

- SDG 11.7.1: Average share of the built-up area of cities that is open space for public use for all, by sex, age and persons with disabilities

Expert meeting webpage: https://seea.un.org/events/expert-meeting-seea-indicators-sdgs-and-post-2020-agenda

Forests fulfil a number of functions that are vital for humanity.

- Target 15.1: By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests.
- **SDG Indicator 15.1.1: Forest area as a proportion of total land area**
- Forest is defined as land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10 percent, or trees able to reach these thresholds in situ. It does not include land that is predominantly under agricultural or urban land use.

Extent of forest ecosystems: Calculating the forest area

To calculate Indicator 15.1.1 using a forest ecosystem extent account, it is necessary to **identify the SEEA EA ecosystem types that are consistent with the definition of forests** used in the indicator:

- The table presents the forest ecosystem types from the SEEA EA Ecosystem Type Reference Classification, which is derived from the IUCN's Global Ecosystem Typology
- For the purposes of Indicator 15.1.1, forest area can be measured as the sum of the extent (measured in hectares) of each of the ecosystem types listed in the table.

T1.1 Tropical-subtropical lowland rainforests
T1.2 Tropical-subtropical dry forests and scrubs
T1.3 Tropical-subtropical montane rainforests
T1.4 Tropical heath forests
T2.1 Boreal and temperate montane forests and woodlands
T2.2 Deciduous temperate forests
T2.3 Oceanic cool temperate rainforests
T2.4 Warm temperate laurophyll forests
T2.5 Temperate pyric humid forests
T2.6 Temperate pyric sclerophyll forests and woodlands
T7.3 Plantations
TF1.1 Tropical flooded forests and peat forests
TF1.2 Subtropical-temperate forested wetlands
MFT1.2 Intertidal forests and shrublands

Note that it may be necessary to adjust the measure of forest extent under some ecosystem types (e.g., T2.2 – Deciduous temperate forests) to account for the fact that some land areas classified to these types **may not meet the definition** of forests for Indicator 15.1.1.

It may also be necessary to add some areas classified to another ecosystem type (T4.4 Temperate woodlands) **if these meet the indicator definition.**

Forests in Ecosystem Extent Accounts

	T2.1 Boreal and montane needle-leaved forest and woodland*	T2.3 Cool temperate rainforests*	T4.4 Temperate wooded savannas^	T4.5 Temperate grasslands	T6.4 Temperate alpine meadows and shrublands	T7.1 Croplands	T7.2 Sown pastures and old fields	T7.3 Plantations*	T7.4 Urban and infrastructure lands	FT1.2 Seasonal floodplain marshes	FT1.5 Boreal, temperate and montane peat bogs	TOTAL LAND AREA	F1.1 Permanent upland streams	F1.2 Permanent lowland rivers	F2.2 Large permanent freshwater lakes	F2.3 Small permanent freshwater lakes	F4.1 Large reservoirs	TOTAL AREA
Opening Stock (ha)	A1	A2						A3				B						
Additions to stock																		
Managed expansion																		
Natural Expansion																		
Upward reappraisals																		
Other additions																		
Total additions to stock																		
Reductions in stock																		
Managed regression																		
Natural Regression																		
Downward reappraisals																		
Other reductions																		
Total reductions in stock																		
Net change in stock																		
Closing stock (ha)	A1[1]	A2[1]						A3[1]				B[1]						

* Green Indicates ecosystem types relevant to forest area of SDG indicator 15.1.1.

^ Orange indicated the type may conflate forests with other vegetation types that do not contribute to SDG 15.1.1

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Calculating SDG 15.1.1 – An example

	T2.1 Boreal and montane needle-leaved forest and woodland*	T2.3 Cool temperate rainforests*	T4.4 Temperate wooded savannas^	T4.5 Temperate grasslands	T6.4 Temperate alpine meadows and shrublands	T7.1 Croplands	T7.2 Sown pastures and old fields	T7.3 Plantations*	T7.4 Urban and infrastructure lands	FT1.2 Seasonal floodplain marshes	FT1.5 Boreal, temperate and montane peat bogs	TOTAL LAND AREA
Opening Stock (2010, ha)	**40,000**	**40,000**	5,000	30,000	25,000	80,000	30,000	**15,000**	7,500	7,500	2,500	**282,500**
Additions to stock												
Managed expansion												
Natural Expansion												
Upward reappraisals												
Other additions												
Total additions to stock	1,000	500	1,000	300	50	2,000	1,300	15,500	1,500	50	-	23,200
Reductions in stock												
Managed regression												
Natural Regression												
Downward reappraisals												
Other reductions												
Total reductions in stock	500	-	1,500	1,450	750	9,000	5,000	1,500	300	3,000	250	23,250
Net change in stock	500	500	(500)	(1,150)	(700)	(7,000)	(3,700)	14,000	1,200	(2,950)	(250)	(50)
Closing stock (2015, ha)	**40,500**	**40,500**	4,500	28,850	24,300	73,000	26,300	**29,000**	8,700	4,550	2,250	**282,450**

* Green Indicates ecosystem types relevant to forest area of SDG indicator 15.1.1.

^ Orange indicated the type may conflate forests with other vegetation types that do not contribute to SDG 15.1.1

$$SDG\ 15.1.1 = \frac{40{,}000 + 40{,}000 + 15{,}000}{282{,}450} = \frac{95{,}000}{282{,}450} = 0.34\ or\ 34\%\ (For\ 2010)$$

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Wetlands and other water related ecosystems are critical for the supply ecosystem services.

- Target 6.6: By 2020 protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes
- **SDG indicator 6.6.1: Change in the extent of water-related ecosystems over time**
  - Wetlands
  - Open waters
  - Artificial water bodies
  - Vegetated wetlands

Extend of water-related ecosystems: Calculating the water-related area

To calculate the indicator, a decision is required on the water-related ecosystem types to include:

- The table shows **the ecosystem types from the SEEA EA Ecosystem Type Reference Classification** that could be considered relevant to the indicator.

- If this classification is not used in a country, compilers should **consult with relevant stakeholders** to determine the ecosystem types from the national classification to be included in calculation of the indicator.

F1.1 Permanent upland streams
F1.2 Permanent lowland rivers
F1.3 Freeze-thaw rivers and streams
F1.4 Seasonal upland stream
F1.5 Seasonal lowland rivers
F1.6 Arid episodic arid rivers
F1.7 Large lowland rivers
F2.1 Large permanent freshwater lakes
F2.2 Small permanent freshwater lakes
F2.3 Seasonal freshwater lakes
F2.4 Freeze-thaw freshwater lakes
F2.5 Ephemeral freshwater lakes
F2.8 Artesian springs and oases
F2.9 Geothermal pools and wetlands
F3.1 Large reservoirs
F3.2 Constructed lacustrine wetlands
F3.3 Rice paddies
F3.4 Freshwater aquafarms
F3.5 Canals, ditches and drains
TF1.1 Tropical flooded forests and peat forests
TF1.2 Subtropical-temperate forested wetlands
TF1.3 Permanent marshes
TF1.4 Seasonal floodplain marshes
TF1.5 Episodic arid floodplains
TF1.6 Boreal, temperate and montane peat bogs
TF1.7 Boreal and temperate fens
FM1.1 Deepwater coastal inlets (when influenced by freshwater)
FM1.2 Permanently open riverine estuaries and bays
FM1.3 Intermittently closed and open lakes and lagoons
MFT1.1 Coastal river deltas
MFT1.2 Intertidal forests and shrublands
MFT1.3 Coastal saltmarshes and reedbeds

Water related ecosystems in Ecosystem Extent Account

	Ecosystem type (IUCN ET)																					TOTAL AREA
	T2.2 Temperate deciduous forests and shrublands	T4.4 Temperate wooded savannas	T4.5 Temperate grasslands	T6.4 Temperate alpine meadows and shrublands	T7.1 Croplands	T7.2 Sown pastures and old fields	T7.3 Plantations	T7.4 Urban and infrastructure lands	FT1.2 Seasonal floodplain marshes*	FT1.3 Subtropical/temperate forested wetlands*	F1.1 Permanent upland streams*	F1.2 Permanent lowland rivers*	F2.2 Large permanent freshwater lakes*	F2.3 Small permanent freshwater lakes*	F4.1 Large reservoirs*	MFT1.1 Coastal river deltas*	MFT1.3 Intertidal marshes*	FM1.2 Permanently open riverine estuaries and bays*	TOTAL AREA OF WATER-RELATED ECOSYSTEMS*	TM1.3 Sandy Shores	M1.7 Subtidal sandy bottoms	
Opening Stock (ha)																						
Additions to stock																						
Managed expansion																						
Natural Expansion																						
Upward reappraisals																						
Other additions																						
Total additions to stock																						
Reductions in stock																						
Managed regression																						
Natural Regression																						
Downward reappraisals																						
Other reductions																						
Total reductions in stock																						
Net change in stock																						
Closing stock (ha)																						

* Blue Indicates ecosystem types relevant to water-related ecosystems and SDG target indicator 6.6.1

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Calculating SDG 6.6.1 – An example

	Ecosystem type (IUCN ET)															
	T7.3 Plantations	T7.4 Urban and infrastructure lands	FT1.2 Seasonal floodplain marshes*	FT1.3 Subtropical/temperate forested wetlands*	F1.1 Permanent upland streams*	F1.2 Permanent lowland rivers*	F2.2 Large permanent freshwater lakes*	F2.3 Small permanent freshwater lakes*	F4.1 Large reservoirs*	MFT1.1 Coastal river deltas*	MFT1.3 Intertidal marshes*	FM1.2 Permanently open riverine estuaries and bays*	TOTAL AREA OF WATER-RELATED ECOSYSTEMS*	TM1.3 Sandy Shores	M1.7 Subtidal sandy bottoms	TOTAL AREA
Opening Stock (2010, ha)	15,000	7,500	**7,500**	**2,000**	**100**	**300**	**1,000**	**750**	**500**	**250**	**450**	**180**	**13,030**	750	1,000	**37,280**
Additions to stock													-			**-**
Managed expansion													-			**-**
Natural Expansion													-			**-**
Upward reappraisals													-			**-**
Other additions													-	50	-	**50**
Total additions to stock	2,000	1,500	50	*20*	-	-	-	-	100	*40*	*25*	*20*	255			**3,755**
Reductions in stock													-			**-**
Managed regression													-			**-**
Natural Regression													-			**-**
Downward reappraisals													-			**-**
Other reductions													-			**-**
Total reductions in stock	1,500	300	1,500	*210*	-	-	-	50	-	*15*	*100*	*30*	1,905	100	-	**3,805**
Net change in stock	500	1,200	(1,450)	(190)	-	-	-	(50)	100	25	(75)	(10)	(1,650)	(50)	-	**-**
Closing stock (2015, ha)	15,500	8,700	**6,050**	**1,810**	**100**	**300**	**1,000**	**700**	**600**	**275**	**375**	**170**	**11,380**	700	1,000	**37,280**

* Blue Indicates ecosystem types relevant to water-related ecosystems and SDG target indicator 6.6.1

$$SDG\ 6.1.1 = \frac{11{,}380\ - 13{,}030}{13{,}030} \times 100 = -13\%\ (for\ 2010\ to\ 2015)$$

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The productive potential of land must be increased to deliver the goods and services required by a growing population.

- Target 15.3: By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world
- **SDG Indicator 15.3.1: Proportion of land that is degraded over total land area**
  - **Land cover**
  - **Land productivity**
  - **Carbon stock**

Description of SDG 15.3.1.

- SDG 15.3.1 is grounded in three sub-indicators:
  1. Evaluation of land cover and land cover changes
  2. Analysis of land productivity status and trends based on net primary productivity.
  3. Determination of carbon stock values and changes
- An area of land is degraded if it is assessed as being degraded on any one of these three sub-indicators
- Baseline is from 2000 to 2015. LDN means no further net degradation between 2015 and 2030. Tends reported every 4 years to UNCCD (See SDG 15.3.1 Good Practice Guidance*).
- The SEEA can support calculating this indicator
  - > Informing on land cover flows (Ecosystem Extent or Land Cover Accounts)
  - > Providing spatial data infrastructure for integrating information on land productivity and carbons stock (Ecosystem Condition Accounts)

* https://www.unccd.int/sites/default/files/relevant-links/2017-10/Good%20Practice%20Guidance_SDG%20Indicator%2015.3.1_Version%201.0.pdf

Ecosystem change matrix– Define flows nationally

Original Type in 2000 \ Type in 2015	T2.2 Temperate deciduous forests and shrublands	T4.4 Temperate wooded savannas	T4.5 Temperate grasslands	T6.4 Temperate alpine meadows and shrublands	T7.1 Croplands	T7.2 Sown pastures and old fields	T7.3 Plantations	T7.4 Urban and infrastructure lands	FT1.2 Seasonal floodplain marshes	FT1.5 Boreal, temperate and montane peat bogs	F1.1 Permanent upland streams	F1.2 Permanent lowland rivers	F2.2 Large permanent freshwater lakes	F2.3 Small permanent freshwater lakes	F4.1 Large reservoirs	Opening Extent (2000)	Reductions
	Ecosystem change matrix (IUCN ET)																
T2.2 Temperate deciduous forests and shrublands^	220				10	5	10	5								250	30
T4.4 Temperate wooded savannas^		215			10	10	-	15								250	35
T4.5 Temperate grasslands		5	55			20		20								100	45
T6.4 Temperate alpine meadows and shrublands				245		5										250	5
T7.1 Croplands	0	5		20	165			55	5							250	85
T7.2 Sown pastures and old fields	0	0			20	195	5	25	5							250	55
T7.3 Plantations	0	0	10	10	20		110		0							150	40
T7.4 Urban and infrastructure lands	0	0	5					45	10							60	15
FT1.2 Seasonal floodplain marshes					5	10	-		45							60	15
FT1.5 Boreal, temperate and montane peat bogs										60						60	0
F1.1 Permanent upland streams											5					5	0
F1.2 Permanent lowland rivers												10				10	0
F2.2 Large permanent freshwater lakes													20			20	0
F2.3 Small permanent freshwater lakes														10		10	0
F4.1 Large reservoirs															10	10	0
Closing Extent (2015)	220	225	70	275	230	245	125	165	65	60	5	10	20	10	10	1,735	
Additions degradation					25	25	10	40								100	
Additions improvement	0	5	5						20							30	
Additions stable	0	5	10	30	40	25	5	80	0	0	0	0	0	0	0	195	

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Ecosystem condition accounts for SDG 15.3.1

Classifications >>		T2.2 Temperate deciduous forests and shrublands	T4.4 Temperate wooded savannas	T4.5 Temperate grasslands	T6.4 Temperate alpine meadows and shrublands	T7.1 Croplands	T7.2 Sown pastures and old fields	T7.3 Plantations	T7.4 Urban and infrastructure lands	FT1.2 Seasonal floodplain marshes	FT1.5 Boreal, temperate and montane peat bogs
Annual Net Primary Productivity (million tonnes dry matter / ha / year)	*Opening (2000)*										
	Closing (2015)										
Soil Organic Carbon Stocks (tonnes carbon / ha)	*Opening (2000)*										
	Closing (2015)										

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Draft decision from UNSC 2022

The United Nations Statistical Commission at its recent 53nd session in March 2022

- *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 supported the Committee's work in ensuring that the SEEA is recognized as the underlying methodological basis for the compilation of the relevant headline indicators of the monitoring framework of the post-2020 global biodiversity agenda; (Decision 18(g))*

Source: https://unstats.un.org/unsd/statcom/53rd-session/documents/decisions/Full-Decisions.pdf

SEEA and the post-2020 Global Biodiversity Framework

- The Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) at its 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"*
- Additionally, the meeting included in the draft recommendation for the Conference of the Parties a decision on establishing an ad hoc technical expert group to advise on the further operationalization of the monitoring framework for the post-2020 global biodiversity framework .
- SEEA is now being proposed as the methodological basis for several headline indicators in the provisional monitoring framework of the post-2020 global biodiversity framework (CBD/WG2020/3/3/Add.1 - 11 July 2021)

Source: Non-Paper on SBSTTA-24 Agenda item 3
https://www.cbd.int/doc/c/13e9/73d6/0de346d7d3433024a3ef1441/sbstta-24-nonpaper-item-03-v1-en.pdf

Headline indicators where SEEA serves as the methodological basis

- SEEA-based headline indicators
  - Goal A: Extent of selected natural and modified ecosystem (i.e. forest, savannahs and grasslands, wetlands, mangroves, saltmarshes, coral reef, seagrass, macroalgae and intertidal habitats)*
  - Goal B: National environmental economic accounts of ecosystem services*
  - Target 9: National environmental-economic accounts of benefits from the use of wild species*
  - Target 11: National environmental-economic accounts of regulation of air quality, quality and quantity of water, and protection from hazards and extreme events for all people, from ecosystems*
  - Target 14: Integration of biodiversity into national accounting and reporting systems, defined as implementation of the System of Environmental-Economic Accounting*
  - Target 19: Public expenditure and private expenditure on conservation and sustainable use of biodiversity and ecosystems
- The SEEA Ecosystem Accounting Indicator Working Group is tasked with the development of metadata sheets on these indicators, using the template developed through the CBD process, to support the upcoming intergovernmental meetings

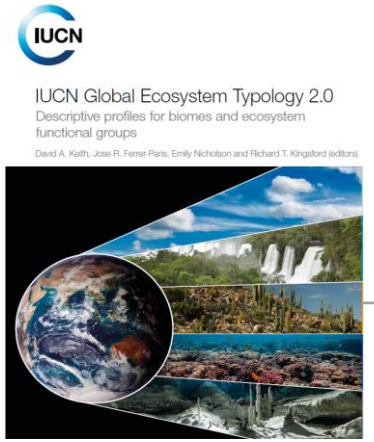
* Denotes indicators where UNCEEA is the proposed indicator custodian

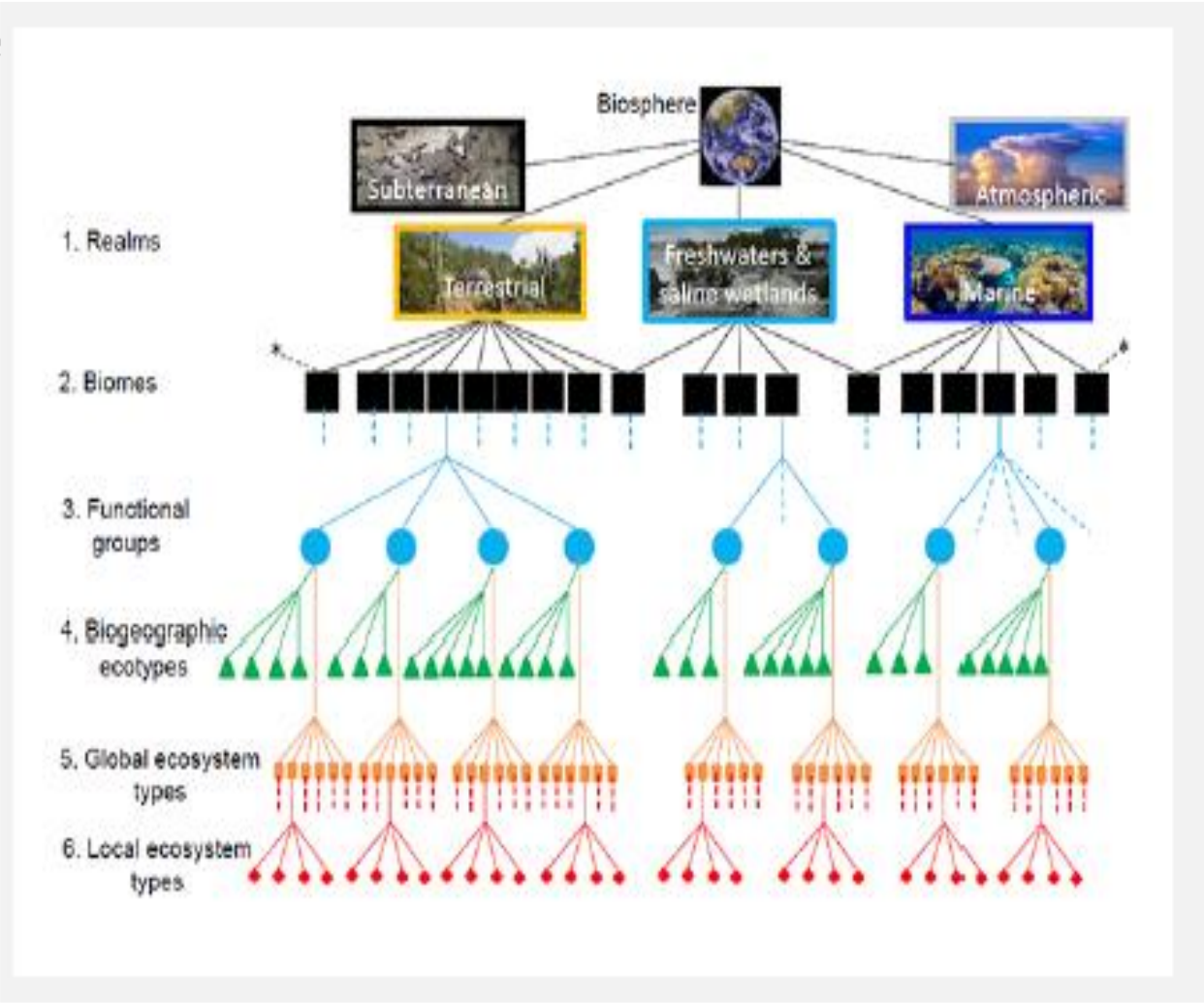
Goal A

Proposed goal or target	*Proposed indicators*[6]	*Proposed disaggregation*	*Existing national reporting/ validation process*	*Methodological basis*	*Global data set for national disaggregation*[7]
Goal A. The integrity of all ecosystems is enhanced, with an increase of at least 15% in the area, connectivity and integrity of natural ecosystems, supporting healthy and resilient populations of all species, the rate of extinctions has been reduced at least tenfold, and the risk of species extinctions across all taxonomic and functional groups, is halved, and genetic diversity of wild and domesticated species is safeguarded, with at least 90% of genetic diversity within all species maintained.	A.0.1 Extent of selected natural and modified ecosystems (i.e. forest, savannahs and grasslands, wetlands, mangroves, saltmarshes, coral reef, seagrass, macroalgae and intertidal habitats)	By terrestrial and marine ecosystem types By mountains		UN System of Environmental-Economic Accounting (SEEA): https://seea.un.org/ecosystem-accounting Ecosystem types based on IUCN categories	Near ready**
	A.0.2 Species Habitat Index	By species group		GEOBON: https://geobon.org/ebvs/indicators/ (Measures connectivity and integrity of habitats)	Existing, 2001 to present**
	A.0.3 Red list index	By species group	SDG (15.5.1)	SDG: IUCN: https://www.iucnredlist.org/	Existing, data from 1996 to present

Ecosystem types

- SEEA EA endorses the IUCN GET as international reference classification
- 6 levels – accounts are compiled at level of the Ecosystem Functional Groups (e.g. tropical lowland rainforest)





Realms	Biomes
Terrestrial	T1 Tropical–subtropical forests
	T2 Temperate–boreal forests & woodlands
	T3 Shrublands & shrubby woodlands
	T4 Savannas and grasslands
	T5 Deserts and semi-deserts
	T6 Polar-alpine
	T7 Intensive land-use systems
Freshwater	F1 Rivers and streams
	F2 Lakes
	F3 Artificial fresh waters
Marine	M1 Marine shelfs
	M2 Pelagic ocean waters
	M3 Deep sea floors
	M4 Anthropogenic marine systems
Subterranean	S1 Subterranean lithic
	S2 Anthropogenic subterranean voids
Transitional	TF1 Palustrine wetlands
	FM1 Semi-confined transitional waters
	MT1 Shoreline systems
	MT2 Supralittoral coastal systems
	MT3 Anthropogenic shorelines
	MFT1 Brackish tidal systems
	SF1 Subterranean freshwaters
	SF2 Anthropogenic subterranean freshwaters
	SM1 Subterranean tidal

Defining ecosystems based on IUCN GET

Ecosystems	IUCN GET Biomes/ Ecosystem Functional Group
Forest	T1 Tropical-subtropical lowland rainforests biome
	T2 Tropical-subtropical dry forests and scrubs biome
Savannahs and Grasslands	T4 Savannas and grasslands biome
Wetlands	F1 Rivers and streams biome
	F2 Lakes biome
	TF1 Palustrine wetlands biome
	FM1 Semi-confined transitional waters biome
	MFT1 Brackish tidal systems biome
Mangroves	MFT1.2 Intertidal forests and shrublands
Saltmarshes	MFT1.3 Coastal saltmarshes and reedbeds
Coral reef	M1.3 Photic Coral reefs
Seagrass	M1.1 Seagrass meadows
Macroalgae	M1.5 Photo-limited marine animal forests
	SM1.2 Anchialine pools
Intertidal habitats	MT1 Shoreline systems biome
	MT2 Supralittoral coastal systems biome
	MT3 Anthropogenic shorelines biome

Ecosystem extent account

	Selected ecosystem types (based on Level 3 - EFG of the IUCN Global Ecosystem Typology)																		
Realm	Terrestrial												Freshwater			Marine			
Biome	T1 Tropical-subtropical forests				T2 Temperate-boreal forests and woodlands				...		T7		F1	...	FM1	M1	...	MFT1	
Selected Ecosystem Functional Group (EFG)	Tropical-subtropical lowland rainforests	Tropical-subtropical dry forests and scrubs	Tropical-subtropical montane rainforests	Tropical heath forests	Boreal and temperate high montane forests and woodlands	Deciduous temperate forests	...	Temperate pyric sclerophyll forests and woodlands	...	...	...	Derivied semi-natural pastures and old fields	Permanent upland streams	...	Intermittently closed and open lakes and lagoons	Seagrass meadows	...	Coastal saltmarshes and reedbeds	TOTAL
	T1.1	T1.2	T1.3	T1.4	T2.1	T2.2	...	T2.6	...	...	...	T7.5	F1.1	...	FM1.3	M1.1	...	MFT1.3	
Opening extent																			
Additions to extent																			
Managed expansion																			
Unmanaged expansion																			
Reductions in extent																			
Managed reductions																			
Unmanaged reductions																			
Net change in extent																			
Closing extent																			

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Source: SEEA EA

Goal B (CBD/WG2020/3/3/Add.1 - 11 July 2021)

Proposed goal or target	Proposed indicators	Proposed disaggregation	Existing national reporting/ validation process	Methodological basis	Global data set for national disaggregation
Goal B. Nature's contributions to people have been valued, maintained or enhanced through conservation and sustainable use supporting the global development agenda for the benefit of all.	B.0.1 National environmental economic accounts of ecosystem services*	By ecosystem type and type of service		UN System of Environmental Economic Accounting: https://seea.un.org/ecosystem-accounting. This indicator would be measured in physical and monetary terms and links with the concept of a Gross Ecosystem Product.	Near ready**

•[1] Indicators marked with an asterisk "*" are not yet developed.
[2] Two asterisks (**) indicate that additional information will be provided for the third meeting of the Working Group on the Post-2020 Global Biodiversity Framework in an information document.

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Targets 9, 11

Target 9. Ensure benefits, including nutrition, food security, medicines, and livelihoods for people especially for the most vulnerable through sustainable management of wild terrestrial, freshwater and marine species and protecting customary sustainable use by indigenous peoples and local communities.	9.0.1 National environmental-economic accounts of benefits from the use of **wild species**	SEEA: https://seea.un.org/ecosystem-accounting (disaggregation of accounting information from Goal B)	Near ready **
Target 11. Maintain and enhance nature's contributions to regulation of air quality, quality and quantity of water, and protection from hazards and extreme events for all people	11.0.1 National environmental-economic accounts of **regulation of air quality, quality and quantity of water, and protection from hazards and extreme events for all people,** from ecosystems	SEEA: https://seea.un.org/ecosystem-accounting (disaggregation of accounting information from Goal B)	Near ready**

Reference list of ecosystem services in SEEA EA

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		

Target 9

Target 11

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)	Target 11	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		

Metadata for Goal A, Goal B, Target 9 and Target 11

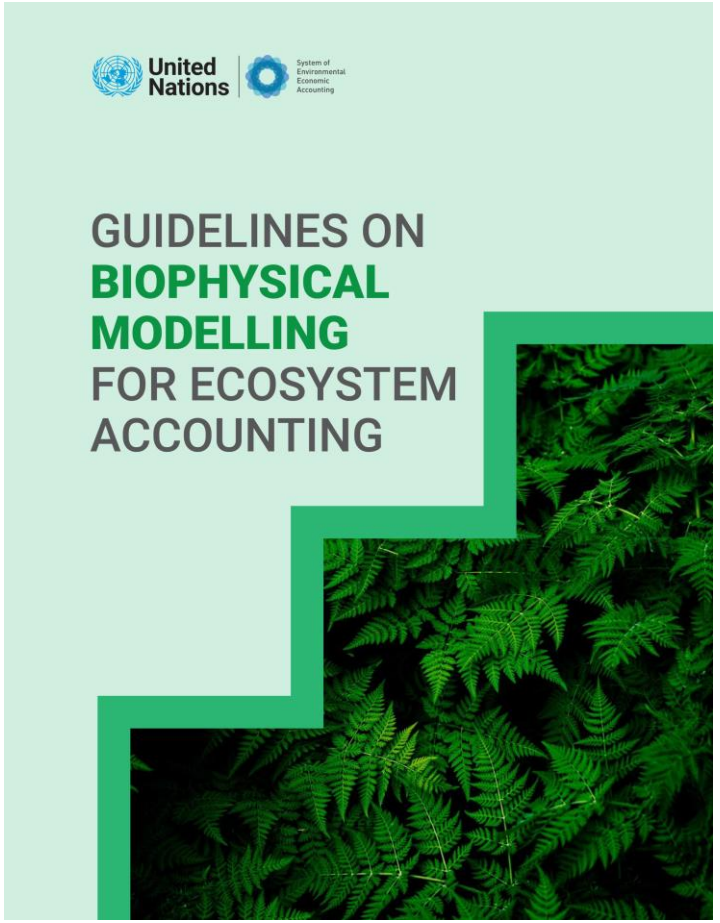
	Goal A	Goal B, Target 9 and 11
Methodology	Ecosystem extent accounts from the SEEA framework	Ecosystem services account from the SEEA framework
Data collection method	▪ National data can be collected through existing sources (databases, maps, reports), including participatory inventories on land management systems as well as remote sensing data collected by national statistical offices and mapping agencies at the national level. ▪ In the absence of national data sources, regional and global datasets will be collected to complement and support existing national indicators through global data platforms and mechanisms endorsed by the UN Statistical Commission. Global estimated data will be sent to national authorities for validation.	
Accessibility	▪ The SEEA Ecosystem Accounting chapters on ecosystem extent and services are adopted as part of an international statistical standard on ecosystem accounting by the United Nations Statistical Commission at its 52th session in 2021. ▪ ARIES for SEEA Explorer is an open access application.	
Global data sources	The ARIES for SEEA Explorer allows to derive a basic ecosystem extent accounting (for the period between 1992 and 2020) in the terrestrial, freshwater and coastal realms using a multilayer look-up table approach which combines global data sources on land cover and other condition metrics to approximate ecosystem function groups	The ARIES for SEEA Explorer allows for compilation of ecosystem services account through an existing ecosystem services modelling platform
Availability and release calendar	Indicators are in development. The global monitoring process for this indicator, the update frequency of update and release calendar are currently under development. The year on when the first round of data will be ready is pending.	

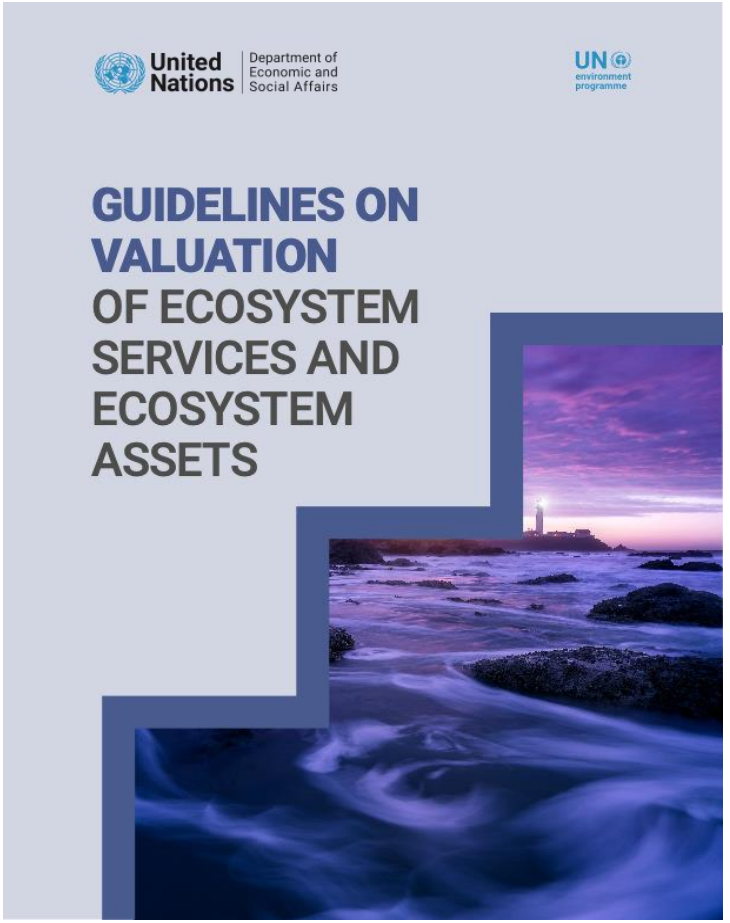
Targets 14, 19

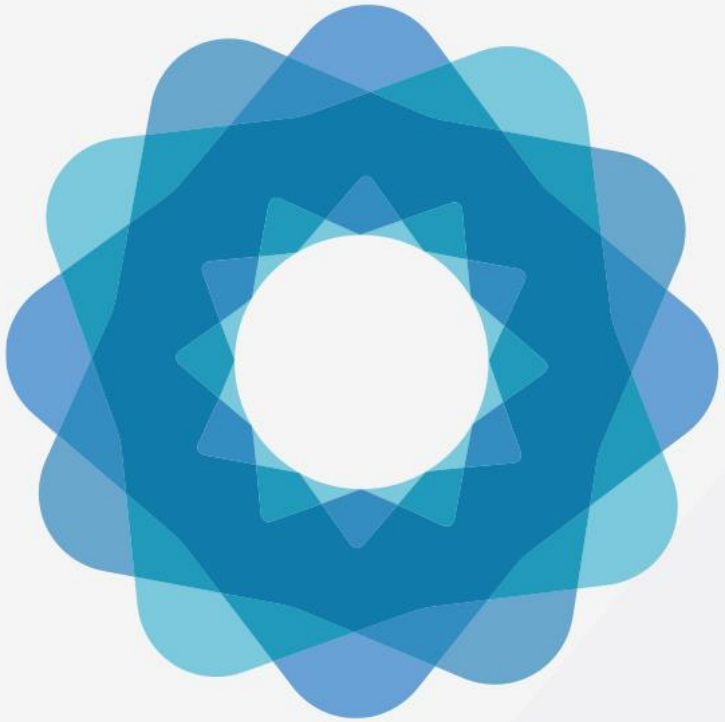
Target 14. Fully integrate biodiversity values into policies, regulations, planning, development processes, poverty reduction strategies, accounts, and assessments of environmental impacts at all levels of government and across all sectors of the economy, ensuring that all activities and financial flows are aligned with biodiversity values.	14.0.2 Integration of biodiversity into national accounting and reporting systems, defined as implementation of the System of Environmental Economic Accounting	SDG: UNSD: https://unstats.un.org/sdgs/metadata/?Text=&Goal=15&Target=15.9	Existing, data from 2015 to present
Target 19. Increase financial resources from all sources to at least200 billion per year, including new, additional and effective financial resources, increasing by at least 10 billion per year international financial flows to developing countries, leveraging private finance, and increasing domestic resource mobilization, taking into account national biodiversity finance planning, and strengthen capacity building and technology transfer and scientific cooperation, to meet the needs for implementing the post-2020 global biodiversity framework implementation, commensurate with the ambition of the goals and targets of the framework	19.0.2 Public expenditure and private expenditure on conservation and sustainable use of biodiversity and ecosystems	Existing methodologies and research by the CBD, BIOFIN and SEEA. Data can be collected through national biodiversity finance plans	Needs developed

Measurement

- Guidelines for the compilation of ecosystem accounts in physical and monetary terms
  - Biophysical modelling
  - > Valuation
- Provide tools to jumpstart accounts compilation, such as ARIES for SEEA Explorer.







System of Environmental Economic Accounting