

System of
Environmental
Economic
Accounting



Using the SEEA for SDG 15

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**Portions of this slide deck have kindly been provided by Sara Minelli, Programme Officer, UNCCD*



United Nations

15 LIFE ON LAND

Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.

 Find out more



Deriving indicators using the SEEA

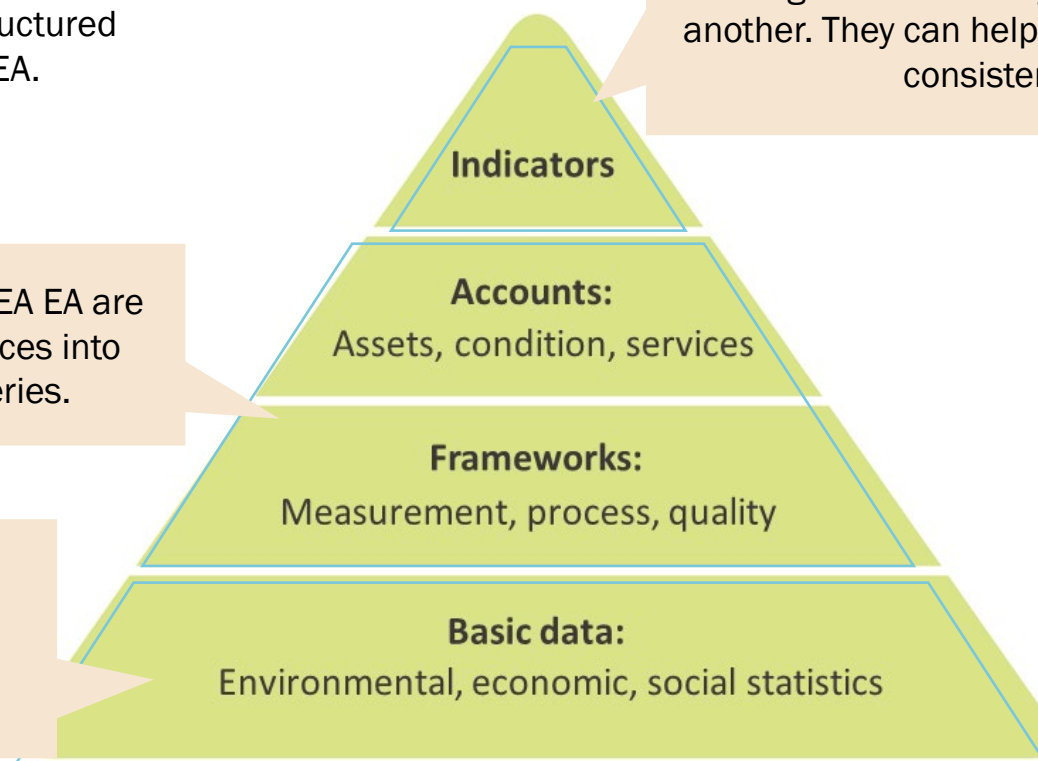
Benefits of the use of structured data

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.



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

- Target 15.1: By 2030, 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.

15 LIFE
ON LAND



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**.

Metadata: <https://unstats.un.org/sdgs/metadata/files/Metadata-15-01-01.pdf>

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																		
<i>Total additions to stock</i>																		
Reductions in stock																		
Managed regression																		
Natural Regression																		
Downward reappraisals																		
Other reductions																		
<i>Total reductions in stock</i>																		
<i>Net change in stock</i>																		
Closing stock (ha)	A1¹	A2¹						A3¹				B¹						

* 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

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												
<i>Total additions to stock</i>	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												
<i>Total reductions in stock</i>	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

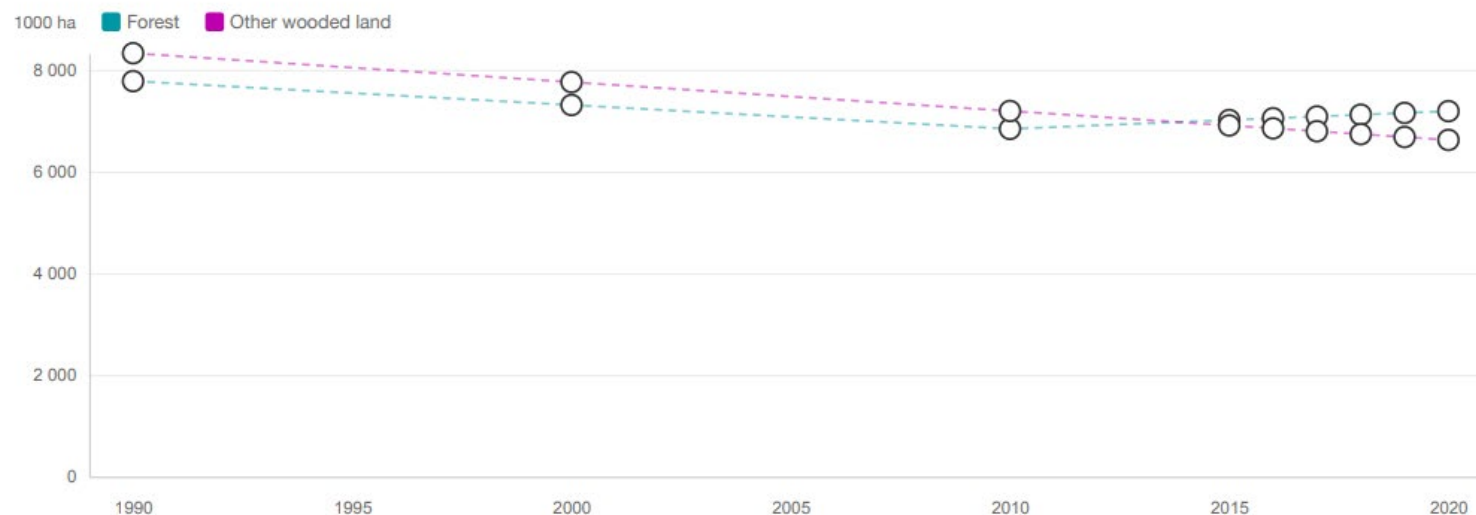
* Green Indicates ecosystem types relevant to forest area of SDG indicator 15.1.1.

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

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

15.1.1 in the Philippines

- Forest Management Bureau
- Data from 2003, 2010 and 2015 from NAMRIA



C. 2015 NATIONAL FOREST ASSESSMENT (LAND COVER MAPPING OF

NATIONAL CLASS	AREA (ha)	Area (in '000 ha)
Forest		
Closed Forest	2,028,015	2,028.02
Open Forest	4,682,751	4,682.75
Mangrove	303,387	303.39
Sub-total (Forest)	7,014,153	7,014.15
Other Wooded Land		
Brush/Shrubs	6,034,655	6,034.66
Other Land		
Open/Barren	121,717	121.72
Grassland	1,961,766	1,961.77
Marsh/Swamps	140,135	140.14
Annual crops	6,117,448	6,117.45
Perennial crops	6,574,379	6,574.38
Built-up areas	852,123	852.12
Fishpond	235,824	235.82
Sub-total (Other land)	16,003,392	16,003.39
Inland Water		
Inland water	511,154	511.15
TOTAL	29,563,354	29,563.35

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**



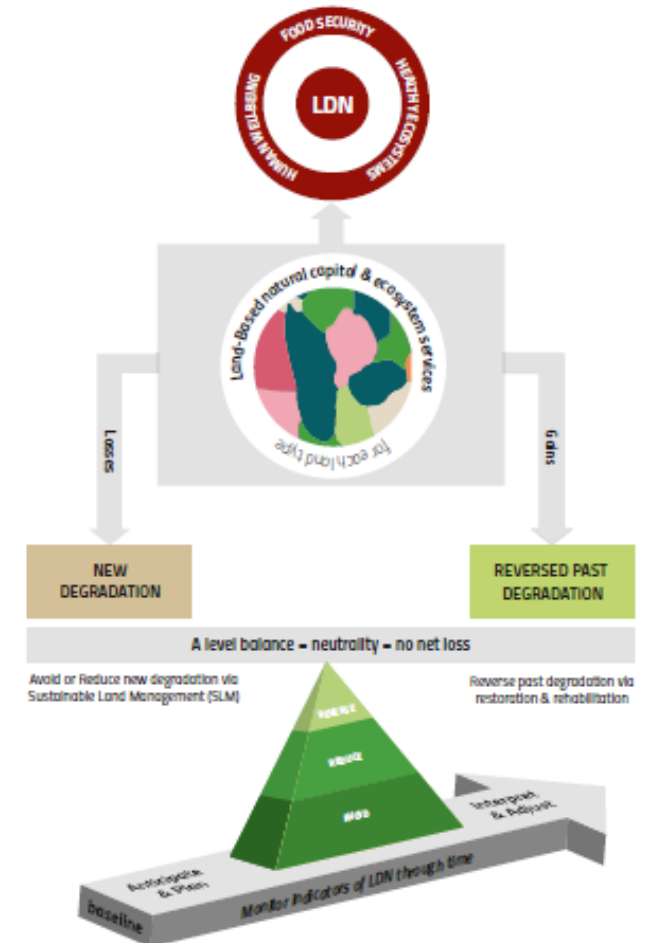
Land Degradation

The reduction or loss of the biological or economic productivity and complexity of rain fed cropland, irrigated cropland, or range, pasture, forest and woodlands resulting from a combination of pressures, including land use and management practices.

Land Degradation Neutrality (LDN)

“A state whereby the amount and quality of land resources necessary to support ecosystem functions and services and enhance food security remain stable or increase within specified temporal and spatial scales and ecosystems”

UNCCD COP12 October 2015

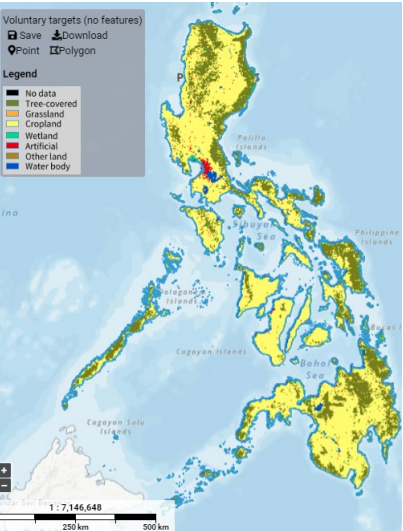


SDG Indicator 15.3.1

Proportion of land degraded over total land area

3 ESSENTIAL VARIABLES:

Tier 1



LAND COVER



LAND PRODUCTIVITY



SOIL ORGANIC CARBON

“ONE OUT
ALL OUT”

SDG 15.3.1



One out all out rule

If one of the sub-indicators shows significant reduction or negative change (or is stable when degraded in the baseline or previous reporting period) for a particular land unit, then it would be considered as degraded subject to validation by national authorities

Sub indicator			Indicator
Land cover	Productivity	SOC	Degraded
Y	Y	Y	Y
Y	Y	N	Y
Y	N	Y	Y
Y	N	N	Y
N	Y	Y	Y
N	Y	N	Y
N	N	Y	Y
N	N	N	N

$$A(Degraded)_{i,n} = A(persistent)_{i,n} + A(recent)_{i,n} - A(improved)_{i,n}$$

A(persistent)_{i,n} = Areas of land that have persisted in a degraded state since the baseline period,

A(recent)_{i,n} = Areas that have degraded since the baseline period

A(improved)_{i,n} = Areas that have improved from a degraded state to a non-degraded state since the baseline period.

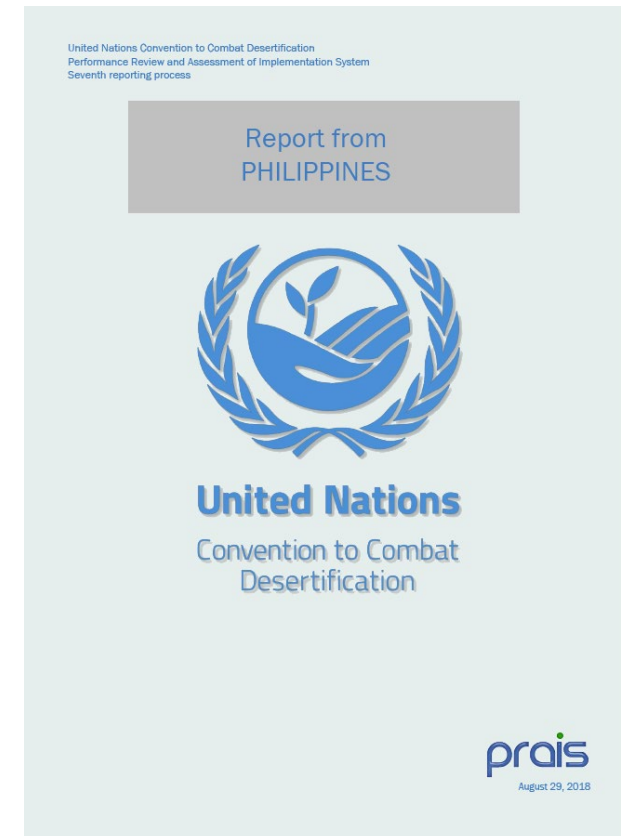
How is reporting done?

- Baseline is 2015, with its value derived from an initial quantification/assessment of time series for sub-indicators during period 2000-2015.
- Trends reported every four years to UNCCD (See SDG 15.3.1 Good Practice Guidance*).
- Single figure, but best to disaggregate spatially
- Default data sources

Sub indicator	Default data sources
Land cover	European Space Agency Climate Change Initiative Land Cover, 300m, annual from 2000 to 2019
Land productivity	Joint Research Centre Land Productivity Dynamics (LPD) dataset, 1 km, 2000-2019
Soil organic carbon stocks	ISRIC SoilGrids250m, 250m, based on a modified Tier 1 method that uses land cover changes as the dynamic component informing SOC stock changes

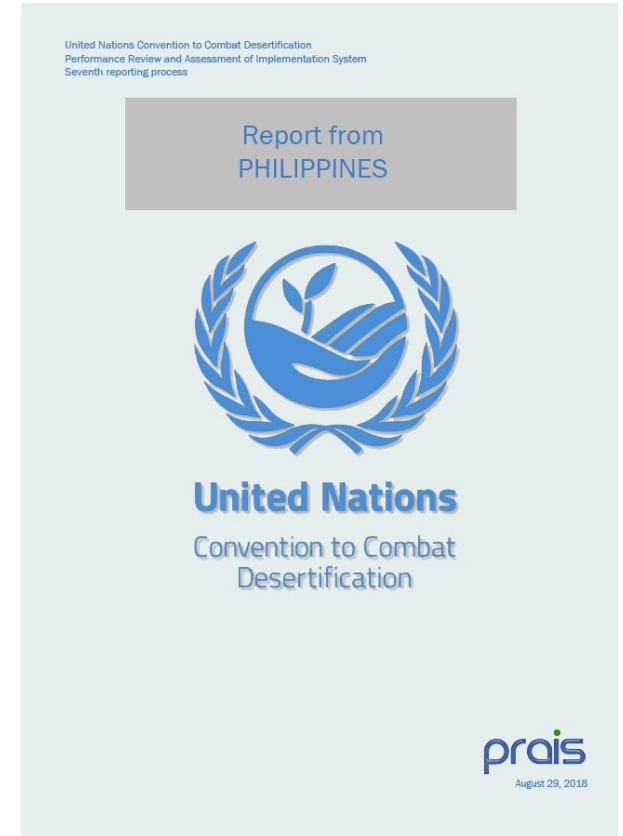
How can the SEEA support 15.3.1?

- But Parties may report their estimates using other data sources/national land cover data
- The SEEA can support calculating this indicator by...
 - > Informing on land cover changes (ecosystem extent or land cover accounts)
 - > Providing spatial data infrastructure for integrating information on land productivity and carbons stock (ecosystem condition accounts)
- Who reports in Philippines? → Bureau of Soil and Water Management
- Latest report is 2018*, uses data from NAMRIA for 2004, 2010 and 2015



Country targets

- In addition to reporting their own estimates, Parties can also set specific targets
- In the Philippines, the following LDN targets are set for 2030 (2018 report):
 - > Attain LDN in at least 60% of forest, shrubland and wetlands, and 50% in croplands and achieve the balance by 2045
 - > Attain LDN in five river basins
 - > Strengthen consensus based stewardship of protected areas and ancestral domain
 - > Improve soil organic carbon in chemically degraded agricultural areas
 - > Improve urban resilience to CC and DR by preventing further forest conversions in watersheds and wetlands
 - > Sustain positive trends in land management (reversion from cropland to forests)



Land cover sub-indicator



The intention of the land cover sub-indicator is to identify where degradation has occurred specifically as a result of land cover change (e.g. deforestation, urban expansion, etc.)

Good practice principles to compute the land cover sub-indicator:

- **Identify key degradation processes** that should be included in the country's assessment of land degradation
- **Select a land cover legend** competent for capturing the degradation transitions identified as significant
- **Generate a land cover change matrix** that specifies land cover changes as being either degradation, improvement or neutral transitions

Land cover change matrix

V_ReferenceClass	Annual Crop	Open Forest	Brush	Inland Water	Closed Forest	Grassland	Barren	Built-up	Perrenial	Fishpond	Total
Annual Crop	1,583,865,000	88,180,000	437,742,500	32,537,500	417,500	68,917,500	7,210,000	62,177,500	17,612,500	2,085,000	2,300,745,000
Open Forest	197,877,500	3,716,697,500	693,870,000	18,637,500	451,145,000	126,107,500	2,470,000	16,975,000	567,500	0	5,224,347,500
Brush	431,882,500	1,246,140,000	3,314,100,000	36,955,000	36,387,500	879,960,000	8,102,500	38,160,000	15,017,500	0	6,006,705,000
Inland Water	27,500,000	14,712,500	30,132,500	112,602,500	3,972,500	13,765,000	29,342,500	1,397,500	332,500	47,500	233,805,000
Closed Forest	5,187,500	451,410,000	75,110,000	8,330,000	2,010,852,500	3,982,500	400,000	155,000	0	0	2,555,427,500
Grassland	112,400,000	43,440,000	311,345,000	8,540,000	2,462,500	867,205,000	1,607,500	5,822,500	2,545,000	132,500	1,355,500,000
Barren	19,560,000	915,000	5,800,000	22,352,500	0	23,292,500	58,352,500	617,500	267,500	30,000	131,187,500
Built-up	26,615,000	3,707,500	14,545,000	642,500	2,500	1,790,000	415,000	109,927,500	792,500	55,000	158,492,500
Perennial	5,820,000	865,000	7,132,500	137,500	0	2,152,500	62,500	1,065,000	4,727,500	0	21,962,500
Total	2,410,707,500	5,566,067,500	4,889,777,500	240,735,000	2,505,240,000	1,987,172,500	107,962,500	236,297,500	41,862,500	2,350,000	17,988,172,500
Additions degradation	0	0	0	0	0	0	49,610,000	125,752,500	0	0	
Additions improvement	19,560,000	89,095,000	443,542,500	22,352,500	2,880,000	92,210,000	0	617,500	17,880,000	30,000	
Additions stable	2,391,147,500	5,476,972,500	4,446,235,000	218,382,500	2,502,360,000	1,894,962,500	58,352,500	109,927,500	23,982,500	2,320,000	

Land cover change matrix, Philippines 2018 report

Land cover area change matrix (in squared kilometers).

Final class \ Initial class	Tree-covered areas	Grassland	Cropland	Wetland	Artificial surfaces	Other land
Tree-covered areas	58.454,85	6.242,51	1.922,66	406,25	73,63	56,89
Grassland	8.383,8	58.320,48	16.933,92	514,51	495,6	165,59
Cropland	1.571,46	13.288,26	103.749	1.314,22	2.790,32	183,01
Wetland	403,05	415,96	1.015,26	5.769,25	100,71	238,41
Artificial surfaces	32,69	251,63	1.618,37	82,57	4.714,1	16,55
Other land	18,89	232,2	135,47	106,52	13,05	367,5



= Identified in the report as the **most significant negative** land cover changes

Ecosystem condition accounts for SDG 15.3.1

Or NDVI,
as a proxy
of NPP

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)										

Using the SEEA EA for Calculating Selected SDG Indicators

Using the SEEA EA
for Calculating Selected
SDG Indicators
Report of the NCAVES Project

- 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



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

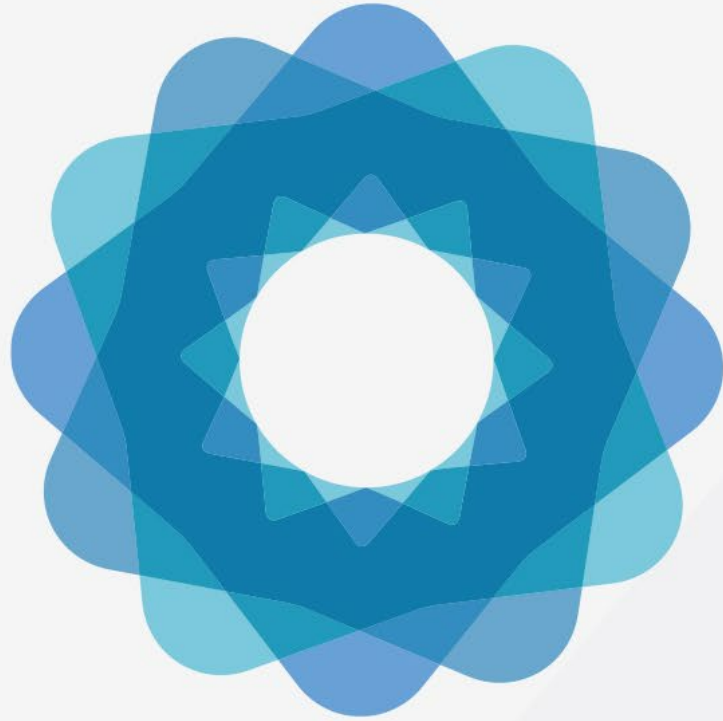


- SDG 6.6.1: Change in the extent of water related ecosystems over time

- 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>



System of Environmental Economic Accounting